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Computer Weekly
Thursday, July 8, 1982

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CII-HB chief 'furious' at £8.5m payment

by Jack Gee

CII-HONEYWELL BULL is off to a demoralising start under French government control, by paying £8.5 million more than it needed to acquire 27.1 per cent of US Honeywell's stake in its equity.

The mis-spent surplus represents the extra cost to CII-HB on the exchange market of the $150 million paid for the Honeywell shares. CII-HB waited until only a few days before the June 28 deadline under the agreement between the holding company Machines Bull and the American firm.

Newly-appointed chairman Jacques Stern is reported to be furious that French Treasury officials, who were well aware of the government's intention to devalue the Franc, failed to make the payment until after the change in the French currency's parity.

Agreement on a payment of $150 million had been reached two months ago and the decision to buy 27.1 per cent of Honeywell's stake was reached on May 28.

The postponement of payment until the middle of June meant that CII-Honeywell Bull paid FFr1,020 million at FFr6.80 to the dollar instead of FFr915 million at FFr6.10 to the dollar.

The difference of FFr105 million is sorely needed by Machines Bull for CII-Honeywell Bull, its 80 per cent-owned subsidiary, which is seriously under-capitalised.

Stern has set the firm's cash needs at FFr two billion (£160 million).

Members of Stern's staff and officials at the Ministry of Industry are blaming Treasury officials for red tape procedures in failing to cover the dollar purchase. But the Treasury is saying that CII-Honeywell Bull failed to prepare the transfer of funds in good time.

A new key appointment at CII-Honeywell Bull is that of Francis Lorentz, a 40-year-old senior civil servant, as joint general manager, in a triumvirate with Maxime Bonnet and Andre Rivière.

Lorentz, who moves into his job in September, has been responsible for strategic industrial planning as head of Codis, a State body responsible for the development of major industries.

Lorentz played an important role as the government's representative during the negotiations for the nationalisation of Thomson-Brandt, the leading French electronics and electrical group.

BOGOD . . . "One can find reasons not to supply skills to any country."

Policy on human rights comes under fire

by Boris Sedacca

THE issue of human rights violations and the supply of sophisticated computer systems to repressive regimes has erupted again.

The UK Council for Computing Development has come under fire this week for sending advisers to countries which have "an appalling record for their lack of human rights" (see Letters, page 9).

"This does not surprise me," added one senior industry source close to the UKCCD. "I do not like the way they select their consultants – it is a bit of a club.

"I am not happy myself about the types of projects which they are taking on and I do not feel they are beneficial to the people of those countries, most of which could do with basic training in minicomputers and business skills, not grandiose scientific projects."

Doug Eyeions, director-general of the Computing Services Association, which has recently joined the UKCCD, responded: "There is a counter-argument to the effect that the use of intermediate technology only results in keeping a country backward, but I do not want to come down on either side of the debate.

"As far as the CSA is concerned, if the government of a country says it wants to keep a project labour-intensive, we will do it that way. It is up to that government to decide on its requirements."

Julian Bogod, director of the UKCCD, explained that the posts which his organisation is seeking to fill are all sponsored and managed by the relevant United Nations organisations and other international aid organisations.

The UN circulates job descriptions to national bodies such as our own Commonwealth Office and International Recruitment Unit, which will keep files of individual specialists and consultants in various fields such as hydroelectric dam construction or irrigation. The UKCCD acts as agent of the International Recruitment Unit for computing specialists.

Bogod added: "Should we refuse help to countries whose politics we do not agree with, or do we decide not to supply skills into certain applications? As far as Turkey is concerned, we will supply that country as long as we have normal diplomatic relations with them. One can find reasons not to supply skills to any country."

Itel leasing claims settled by Lloyd's

by Maggie McLening

LLOYD'S insurance underwriters has finally settled computer leasing claims which came out of the crash of Itel Corp. Lloyd's has paid out a "final" $4 million, which is only a fraction of what was the highest claim in its 300-year history.

But the settlement may not be the end of the story. Two further legal actions brought against Lloyd's by computer leasing companies are due to be heard in the US within the coming year, and the amount involved in one of these cases is over $600 million.

Itel Corp, once a leading vendor of IBM plug-compatible mainframes, filed for bankruptcy in January 1981, declaring debts of $1.6 million, and assets valued at $1.1 billion. The company had suffered a serious blow when IBM introduced its 4300 series of medium-sized mainframes in 1979, rendering its own stock of IBM mainframes obsolete.

After Itel's spectacular crash over 14,000 claims flooded into the market, and a total of $120 million has now been paid in insurance claims, about 25% of total computer leasing business accepted by underwriters.

In addition to Lloyd's $4 million, $2 million has been released from an escrow account, and Lloyd's has withdrawn its counter-claim against Itel for $100 million.

One of the reasons for the enormity of the loss is that underwriters did not take into account the speed with which current technology becomes outdated.

WELLS . . . Spotted loophole.

DoI software scheme has 'free labour' flaw

by Maggie McLening

A LOOPHOLE in the revamped Software Products Scheme may allow software houses to recoup total labour costs of development from the Department of Industry.

Applicants for a share of the DoI's £10 million funding have to submit a proposal for their project, estimating costs of all resources involved. Labour charges have to be entered in terms of a manpower rate, which may be based on the rate at which the programmer or analyst would be charged out to another company, and not merely the salary figure companies pay their staff.

This loophole was spotted by Bill Wells, director of ExportIT, the organisation funded by the DoI to promote export of British software and to help establish overseas contacts in the industry.

"Some of these companies charge about three times what the programmer is actually paid as a charge-out rate, so that if the company gets a grant of one-third of the cost they are getting the labour for nothing," he pointed out.

David Else, National Computing Centre manager of the scheme, is adamant that this is not how it is intended to work.

"Companies are allowed to base the calculation on the actual cost of employing staff, but not to include any profit factor in the figure," he said.

There will be a tenuous link between the Software Products Scheme and ExportIT, as applicants for development grants are expected to show that projects have export potential, and advice may be given to them by members of the ExportIT department.

Hitachi denies spy charges

HITACHI, the Japanese computer giant, was last week indicted by a US Federal Grand Jury, for conspiracy to transport stolen IBM secrets to Japan.

But the company, which could stand in the dock with 14 of its employees, has denied that it or its staff have engaged in illegal activities and has advised its staff not to return to the US for trial.

The company admits spending $546,000 to buy information. Charges against executives of Mitsubishi, another Japanese electronics giant, were postponed and NAS has dismissed its two employees involved in the case.

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'82. A great year for PT7. PT7 THE ADVANCED FEATURE TERMINAL FOR ICL AND IBM FERRANTI Computer Systems

£16 million office automation project

ICL staff move into the future

by Claire Gooding

ICL is to practice what it preaches by spending 8% of its total annual payroll, amounting to £16 million, in automating itself, managing director Robb Wilmot has revealed.

By this time next year 80% of ICL's professional staff should be using the hardware, software and automation techniques which ICL is trying to sell to others.

Already ICL has invested in 12 2966 mainframes worth £5½ million for internal use, and Wilmot is planning further capital investment on office automation.

Plans are under way to install the entire range of ICL kit including DRS20 workstations and 8801 word processing equipment.

CAFS, the fast retrieval and data matching tool, will also play a part in the ICL internal workings. CAFS is thought to be only nine months away from release as a commercial tool running under the large-end operating system VME 2900.

The most surprising element of ICL's self-automation is that it has not been done before. Wilmot revealed his plans at a conference held by ICL to launch two productivity tools for the mainframe environment.

ICL's new products are part of the push to increase productivity by making the VME operating system a vehicle for a number of high-level tools. The first announcement was for a teleprocessing builder, TP Easybuild, linked closely to the Data Dictionary, which enables users to create their own screen formats. It joins Report Master and Query Master, already in the pipeline as part of ICL's Rapid Applications Development System.

The second, more far-reaching announcement was ICL's first Applications Blueprint. The idea of the blueprint programs is to provide a framework of re-usable systems analysis and software, based on the Data Dictionary, with the aim of cutting applications development time by 90%. The first, a personnel system, is due out in September.

ICL is to use the methodology itself, and estimates that it will cut development lead times down to six weeks.

Wilmot himself plans to have a terminal on the desk by 1983. He plans to give ICL designers their own Perq workstations, and give managerial and clerical staff access to such tools as DRS20s and 8801 word processors.

Fisher of SPL, Feigenbaum of Stanford University, and Harris of Artificial Intelligence at Fifth Generation Conference in London. Conference reports – pages 5/7.

VLSI changes threaten the computer giants

by Hedley Voysey

THE speed of the changes in advanced design with VLSI (very large scale integration) chips is a threat to major electronics companies such as Siemens, GEC, Hewlett-Packard and others.

For thousands of engineers trained in earlier circuit technologies, representing the majority of the experienced technicians with the large companies, the best design tools and aids are out of their intellectual reach.

Last week Egon Hoerbst of German electronics giant Siemens made a plea for such engineers at one of the two conferences held in the UK to consider the computer's future – the Fifth Generation Conference, held in London, and the International Workshop on Silicon Compilation (VLSI), held in Edinburgh.

He asked the frontier-pushing engineers to remember that tools for the old style of gate array methods will be needed for some time to come.

The problem arises because many engineers have been trained in early circuit design methods, where a design is imposed on a basically performed set of cells by final layers of metal connection. Inefficiencies in this approach have caused advanced research workers to move on to other techniques beyond the skills of most engineers.

Hoerbst said: "Thousands of good, but not super-skilled, engineers know our systems best. The chips will be needed in volumes that are relatively small. They need good aids to designing in gate arrays, so please do something for them."

The response from Howard Shrobe of the Massachusetts Institute of Technology was that "what you want is reasonable but not the job of research institutes."

Curiously, Edinburgh University itself may be able to satisfy both the "go-faster" brigade and the industrialists. Lattice Logic, an Edinburgh-based firm headed by John Gray of the University, is able to supply design aids to support gate array implementations.

At the same time there are developments in the University which use other technologies supported by silicon compiler approaches where the starting point is some functional description and the end point is mask design.

NEWS BRIEF

Motorola settles in 'secrets' case

MOTOROLA has settled a claim against three ex-employees for misappropriating confidental company information and technology. The three, and their company, Computer Displays International, agreed to pay $200,000.

An accompanying federal court order prohibits the three from using proprietary Motorola information or trying to hire Motorola employees, and requires them to allow Motorola to examine the next generation of CRT display products to ensure it does not use Motorola trade secrets.

Schools scheme

PERSEVERANCE by top selling British microcomputer maker Sinclair has paid off. The Department of Industry's Micros in Schools Scheme is expected to be extended this week to primary schools, and with it the addition of the Sinclair Spectrum to the list of machines eligible for a 50% subsidy.

ITT buy-out

THE French government has bought out ITT's telecommunications operation in France for $50 million. The settlement takes ITT out of the French market, though it had hoped to sell only 51% of its operations. ITT is reported to have sought $375 million.

Burroughs suit

A BURROUGHS spokesman in the US last week said that the company was negotiating a settlement in the $160 million suit brought against it in May by the Medical College of Wisconsin over the supply of a system. But on this side of the Atlantic, it is Burroughs that is taking potential customers to court: Report page 2.

Cross joins OTL for attack on US market

by Kevan Pearson

EX-ICL supremo Geoff Cross is to join forces with UK office automation company Office Technology Ltd in its bid to capture a slice of the lucrative US market.

The appointment of Cross as a non-executive director is a major coup for OTL, part of the Information Technology group.

Cross has extensive experience in the US office automation market from his three years as president of AB Dick, which he purchased for General Electric Company (GEC) in 1977. He left AB Dick in May to pursue his personal business interests, and will now devote part of his time to OTL.

The company has recently turned its attention to the US and has demonstrated its IMP, integrated voice and text system, to several major office automation and computer companies in the US.

Spud Taylor, OTL managing director, says he expects Cross to act at a "senior level" in negotiations with potential partners, and to seek out product and market opportunities for OTL directly.

The company is exploring several different avenues of participation in the US market, according to Taylor. It has recently concluded a deal with Nixdorf, the West German computer manufacturer, to manufacture and distribute the system in Europe, and is considering a similar arrangement with a major office automation or computer manufacturer in the US.

CROSS. . . . To act at senior level in negotiations.

Taylor says he approached Cross as soon as he announced that he was leaving AB Dick.

Cross' experience in the computer industry is extensive. He joined ICL in 1972, from Sperry Univac, and was responsible for the purchase by ICL of Singer Business Systems. He left ICL in 1977 to return to the US.

GEC boss bids for stake in AEG

by Kevan Pearson

THE future of ailing German electronics giant AEG-Telefunken was still uncertain early this week after a flying visit by GEC chairman Lord Weinstock and high level meetings of the German government.

Lord Weinstock flew to Frankfurt late last week to attempt to win over the German unions to a £175 million stake in a stripped down AEG. The meetings were not a conspicuous success, although GEC remains interested in taking a 40% share in a possible new AEG subsidiary.

The West German Cabinet was expected to meet yesterday to decide on an interim solution to AEG's severe financial problems.

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Burroughs appeals to EEC over ICL £500,000 contract

by Kevan Pearson

BURROUGHS is to launch a three-prong attack on a recent decision by Oxfordshire Regional Health Authority to award a £500,000 contract to ICL. The company plans to take the case to the EEC, as well as following it up on two fronts in the UK.

The case is being taken to the EEC under a ruling made in 1980 about preferential procurement in public sector contracts. It will be the first time the rule has been invoked against a computer manufacturer.

The other two actions are an appeal against a High Court decision not to grant an injunction against the contract's fulfilment, and a full High Court case claiming damages for a wrongful decision.

Burroughs applied for an injunction on the grounds that the Authority has awarded the contract contrary to the instructions it had given to potential tenderers. Based on the criteria laid down in the instructions, the Burroughs' tender came out top, a Burroughs' spokesman said. However, after a short delay the contract was awarded to ICL.

The judge refused to grant the injunction on four grounds: it would be extremely difficult to decide where a breach of such an injunction had occurred; damages resulting from a full High Court action would be a sufficient remedy without stopping the contract; the urgency with which the contract must be fulfilled; and the difficulty in assessing the cost of delay and the consequential damages payable to Oxford Regional Health Authority if Burroughs lost the case.

Burroughs intends to appeal against the decision not to grant an injunction and to claim damages in a full High Court action. Several other computer companies will be watching the outcome of the action with interest, both in the European courts and in the UK.

IBM has recently taken action against the Severn-Trent Water Authority over the awarding of a contract to ICL and the case will be heard at the end of July. The company is taking a more oblique view. It is seeking a judicial review of the way the Authority reached its decision, and is believed to be seeking an injunction against the fulfilment of the contract, and damages.

Sperry Univac is waiting in the wings and, pending the outcome of the IBM case, will itself decide whether to enter the fray.

These cases represent the culmination of a long-term anger by US-based manufacturers against the preferential procurement policy which had operated in the UK in ICL's favour until the EEC decision in 1980.

IBM campaigned vigorously against the PAYE contract being awarded to ICL, and took the unprecedented step of issuing a statement attacking the decision. The present actions result almost directly from the EEC decision.

While the cases reflect the general principle of public procurement, and are hardly significant in material terms, the Burroughs case is more serious than the others because the initial computer project is likely to be repeated several times over within the Oxford health region. And it is almost certain that the authority would decide to go for compatible systems in all the other sites.

However, it is the general principle which will be tested by the EEC case, and it is this aspect which will attract the closest scrutiny from other overseas suppliers.

Mike Challinor (right) with Dave Olivey, Baric viewdata services manager. Atop the system is Challinor's Champagne prize.

British Telecom turnover takes off — and service companies seek a share

by Donald Kennett

BRITISH TELECOM last week announced soaring profits and turnover as computer services companies waited to see the details of how they can get in on the act.

Sir George Jefferson, BT chairman, unveiled a package of price changes that will add an average of 3.3% to all telephone bills in November and revealed that he expected to report a profit of £450 million for 1981-2. He did not include an estimate for revenue but it is believed to have leapt by a staggering 33% to almost £6 billion, up from £4.5 billion last year.

And this week the draft of a general licence for value-added network services (VANS) is to be circulated for comment by the Department of Industry.

Circulation of the document coincides with a DoI seminar yesterday (Wednesday) to review progress in the liberalisation of telecommunications and delegates are expected to tell the DoI they are unhappy with the rate of progress.

The licence when issued in its final form will allow companies to market services such as electronic mailboxes on British Telecom's networks without applying for special permission.

Anxiety has arisen that the terms of the licence may neither be free enough to encourage the fullest possible development of this new industry nor clear enough to prevent some new services from being challenged in the courts.

The licensing of VANS has been the responsibility of the DoI since April 1 under the provisions of last year's British Telecommunications Act as implemented by the government. The DoI took over responsibility for general licences from British Telecom at the same time and is believed to have decided that a general licence would be more appropriate than specific licences for individual VANS after it was approached by 30 companies wanting to market such services.

Yesterday's seminar was due to be attended by members of the DoI's consultative committee on telecommunications, which was recruited from representatives of equipment suppliers, users and computing service companies to advise the DoI during liberalisation. It is to them that the draft general licence will be circulated.

'Phone me' frame a viewdata winner

by Robert Parry

VIEWDATA systems designer Mike Challinor has struck lucky for a second time with a Prestel message frame design. Last week he won a Champagne prize from British Telecom for his "phone me" frame design for the Prestel Mailbox service, which lets users send messages to each other.

Challinor, who does most of the graphics for ICL bureau Baric's viewdata service, won the award for a Prestel response frame which flashes the words "phone" and "me" alternately, while displaying the name and telephone number of the sender.

Last year he won an award for a Royal Wedding frame.

The demand for information carrying graphics means that new ways are always being sought to use Prestel's rather limited graphics, says Challinor. He mostly designs company logos for customers outside Baric, but has done fine art graphics.

Some rarely see the light of day — done more as exercises to explore techniques — but others appear in the Baric Gallery.

"The alternate flashing of two words is not particularly difficult," says Challinor, "but it does require a bit of planning." He warns that flashing characters can be disturbing, and distract people from other information on the screen.

He sees his frame, which comes up when a user receiving a message keys into the service, as an "urgent phone me" rather than a "please phone me".

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PLESSEY PERIPHERAL SYSTEMS

BIS group sales leap 64% to over £14 million

by Nicholas Enticknap

SOFTWARE and services house BIS has bought its way to soaring profits.

Trading figures that will make most services companies turn green with envy have been released by the BIS group for the year ended last February. Turnover has leapt by 64 per cent to just over £14 million, with pre-tax profits rising by 41 per cent to £1.4 million.

Group chairman Brian Allison attributed the sales increase partly to acquisitions, saying that real growth excluding this factor was around 40 per cent.

Comparing his results with published DoI figures for the services industry as a whole, he estimated that his company was growing almost exactly three times as fast.

Breaking down the figures into the group's constituent parts, BIS Software accounted for sales of £5.7 million, and BIS Applied Systems (the consultancy and training operation) pulled in £3.3 million, with the remaining £5 million coming from marketing and market research activities.

The export performance of BIS Software was officially recognised with a Queens Award for Export Achievement.

Allison was bullish about the future, saying "I'll be terribly disappointed if we don't top £20 million this year, and make a similar increase in pre-tax. Our first quarter performance has put us well on the way to those targets."

The most important of the acquisitions Allison referred to was Christian Braan, a direct mail company. BIS already owned a 35 per cent stake, and increased this during the year to 100 per cent.

● The BIS group has taken a controlling interest in electronics consultancy Ian Mackintosh International. BIS, which already held a 49 per cent shareholding, has taken up an option to increase its stake to 76 percent. The deal will add about £1.5 million to the group's turnover.

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Apple peels 231 names from UK dealer list

by Robert Parry

MICROCOMPUTER manufacturer Apple has axed more than a third of its UK dealers. In the last six weeks 231 names have been dropped from the Apple official dealer list, bringing the number down to 351.

New broom Keith Hall, sales manager for Apple since late May and previously with Commodore, Apple's main rival for the volume personal computer market, has swept through the dealers in an attempt to improve the quality in terms of customer support.

"I'm not happy," said Hall, "since I'm not in the business of reducing dealer lists. But I am in the business of improving quality."

He feels that UK distribution networks for microcomputers are generally beginning to settle, with manufacturers and distributors taking more care over the people they appoint as dealers.

"They must know and understand computer products and be able to provide a level of software and technical support," comments Hall, echoing sentiments mouthed increasingly by those seeking to set up or expand dealer networks.

HALL . . . "I'm not in the business of reducing dealer lists."

The move fits with Apple's shift of emphasis away from the hardware to software and support.

Tom Lawrence, European general manager, sees a shake-out coming in the proliferating micro manufacturers, with 100 or so companies plummeting to just six or seven between 1984 and 1986.

"We don't feel that hot hardware will win the battle," Lawrence says. "All hardware is much the same, so extra little glitches will not tip the balance."

He reckons the winning manufacturers will be those which achieve commitment from the software community — to give the software needed for machines to be accepted by users — and successful sales and distribution channels.

The stance is not surprising, since Apple is commonly seen as lagging behind competitors like Commodore and Tandy in expanding its product line, and is under threat from above as mainstream computer companies move down to the micro market.

Its 16-bit machine still waits in the wings, leaving its computer offerings at the ageing Apple II and the Apple III, which has not made a large impact in the business market.

IBM bans European order switching

by Kevan Pearson

USERS and leasing companies can no longer get massive cash savings by switching their orders between four of IBM's European markets. For IBM has banned the practice called "order diversion" in France, Belgium, Luxembourg and Portugal following the recent round of currency devaluations and the imposition of price control in all four countries.

The company is also to review diversions from Italy on an individual basis, though it will still be possible to divert orders to other European markets.

The order diversion mechanism has been used to provide users with substantial savings because of the currency differences in the separate countries in which IBM operates. It works simply: the customer transfers an order from, say IBM UK to IBM France where the order is fulfilled according to the IBM UK delivery date, but at the price currently available in France.

Both France and Belgium have recently devalued their currencies, and both have announced prices and incomes restraint. This has left IBM and other companies operating in the market without recourse to revising their prices to take account of devaluation. The result could be a significant downturn in sales volume in the countries whose currency has remained stable, as users divert orders to countries with an effective lower price.

On some items of IBM equipment discounts of between 20% and 25% have been possible, according to John Fuller, a director of PCML, the independent leasing company. "Last year the 3033 was very cost effective in terms of diversions," he says. Though the discount was in the region of only 5% on processors, even this is advantageous given the high cost of a 3033 or a 3081.

IBM has been trying to tighten up on the practice for some time, says Fuller. For instance, IBM will not accept diversions in the last 90 days before customer shipment.

Fuller says some users have been able to obtain early shipment 3081s, without paying an early shipment premium.

MoD mainframe order goes to open tender

by Nicholas Enticknap

THE new rules controlling government procurement of computer systems are beginning to bite. The Ministry of Defence has placed an order with Honeywell for three DPS 7/35 systems to be used for naval weapons ordering.

This order, the first placed by the Ministry under the EEC/GATT legislation which came into force in January 1981, went to open tender, unlike previous MoD mainframe orders which, except under special circumstances, were awarded automatically to ICL.

The three systems will be placed in separate naval establishments at Portsmouth, Bath and Weymouth. They will be linked together and will provide mutual back-up.

We'll only use minis where we have to, says DP manager

DISTRIBUTED processing is not always the best solution to computing problems, according to one DP manager.

Ian Morris, computer services manager at quarry operator Tilcon, last week told an Institute of Data Processing Management conference that his company had firmly resolved to use minicomputers only where mainframes were totally impractical.

Speaking in London at the IDPM's annual general meeting Morris said that this decision followed the company's disillusioning experience of installing distributed minicomputers in its Northern and Scottish regional headquarters.

The unsatisfactory results of this exercise contrasted strongly with the success of a mainframe replacement project run at the same time.

Tilcon's story starts in 1980. At that time the company was suffering a downturn in trade as a result of the recession. Management had acquired a good understanding of computers, and were pressing the computer department for enhancements to its service. This was difficult, as the twin mainframe system was purely batch and so systems development was a slow process.

In consequence, a thorough review of all systems was set in motion. This involved both users and top management, and covered manual systems, accounting machines and bureau usage as well as the DP department's activities. The result was a division of opinions about which route to take, both within the computer department and among the users.

Senior management accordingly stepped in and took the decision to go for a new dual mainframe at the centre, capable of supporting on-line working through a network of 50 printers and terminals. In addition, there were to be two minicomputers, each supporting 12 terminals, at the two regional headquarters.

The mainframe installation went in as planned and was, said Morris, in every way satisfactory. This project involved the conversion of 600 programs, which was completed on time within 10 months, and required terminal response times ranging between two and five seconds, which has been achieved.

With the minicomputers (which came from the same supplier as the mainframes) it was a very different story. It was found impossible to keep to the development schedule, despite a high level of (costly) overtime. When the systems were finished they were not as user-friendly as had been planned, and user morale was low.

The operators had to have considerable machine experience and "total involvement". The systems could not be left to their users, but depended heavily on central DP staff support, which naturally had an impact on the mainframe project.

Even technically the minicomputers were disappointing. The response times were very slow — typically 20 to 30 seconds — and it was found that minimal increases in transaction volumes involved disproportionate capital expenditure. Even the basic hardware was more unreliable than that of the mainframes.

In fact the only good thing Morris could find to say about the minicomputer project was that they "had gained experience."

For other users planning to use minis he had three principles to offer. Don't underestimate the effort required. Check and double-check your requirements in detail. And make sure you have access to a spare machine for full testing.

Scots schools conference

SCOTTISH schoolchildren will get a chance to find out how computers are used in industry at the end of the year. A conference, Concept 82, has been organised for December 29 and 30, and will be attended by fifth and sixth form pupils and staff from every secondary school in Scotland.

Concept 82 will be held simultaneously in Glasgow and Edinburgh. There will be about 50 senior executives from local companies and financial institutions at each venture. The conference programme will be announced shortly.

Alexander Fletcher MP, Under-Secretary at the Scottish Office, has agreed to be the principal sponsor. Financial help for the event has been promised by the Scottish Development Agency, the Scottish Education Department and the National Computing Centre.

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Sir Michael to speed Mercury on its way

by Donald Kennett

BL'S saviour Sir Michael Edwardes is all set to work wonders for the UK's forthcoming alternative telecommunications network, Project Mercury, plans for which have already spurred British Telecom to vigorously competitive behaviour.

Last week, he was appointed as a part-time non-executive director of Mercury Communications with a view to becoming its chairman "in due course", probably at the beginning of next year.

Sir Michael joins a Mercury Communications that is at an advanced stage of negotiations with more than 20 potential major customers and is preparing to open its first services next March, almost six months ahead of its initial plans.

A spokesman for BL said Sir Michael had always planned to leave at the end of 1982, although that meant the full results of his work would not show until after he had left. He had set the company on course for needing no more government aid after the end of 1983 and the first evidence of this would appear in the half-year results due in September, the spokesman added.

Sir Michael is said to be attracted to Mercury by the new technology, the new markets and the significant growth potential of the company. All his managerial life before BL was spent at the Chloride Battery group, which he joined as a management trainee in the financial area in 1951 and left as chairman in 1977.

Mercury Communications' marketing director Stuart Bailey said: "Sir Michael is a leading figure of British industry who has an enormous range of skills which will be very welcome to us. He has great personal presence, drive and capability. He will be an excellent man for the job."

Chief executive Derek Evans said: "We are delighted that Sir Michael has agreed to join us in the Mercury venture. His considerable experience will be of great value to the company."

The initial plans for the Mercury network are for £50 million to be invested in providing leased connections for businesses, using optical fibre cables laid alongside railway tracks for the trunk links between 30 towns. Distribution within the towns is to be handled by line-of-sight microwave and cellular radio, a technique used elsewhere for mobile telephone services.

The network is due to start operating next year and details of the first services, in London, are to be announced this week or next week.

Mercury's prospects include a vigorous campaign of opposition from trade unions led by the Post Office Engineering Union and a pledge from the Labour Party to turn it over to British Telecom if it returns to power.

EDWARDES...Always meant to leave BL at end of 1982.

ICL unions accept 5% — except the engineers

by Sarah Hardcastle

ICL staff are to get their first across-the-board pay award for two years. The company's five per cent pay offer has been accepted by all the ICL trades unions with the exception of its service engineers, who are considering strike action unless the offer is significantly improved.

But the pay deal has been accepted only to the end of the year when the five ICL unions, which bargain jointly, will put in a further claim.

Speaking on behalf of the bargaining collective, Tim Webb, national officer of ASTMS, the largest of the ICL unions, said: "The offer has been accepted but with the proviso that a further claim will be made in January next year. This will allow us to ascertain ICL's level of recovery. I've no idea what the new claim will be but it will be based on ICL's full year profits."

According to Webb, the offer was accepted by a two-to-one majority by the main body of ASTMS members which number just over 4,000, and the other ICL unions: AUEW with 700 members, APEX and ACTSS with 600 between them, and BESA.

Following last year's redundancies, about 60 per cent of ICL's 14,000 workforce is now unionised.

The offer will raise basic salaries by five per cent with a minimum increase of £234 per annum for the lowest paid. A merit increase, awarded at ICL's discretion, has been agreed, raising the company's salary bill by a further three per cent.

Though ICL made no across-the-board pay award last year, scale increases and London allowances have been made by the company since the last pay round in 1980.

Left out of these interim awards were the service engineers. As a result the 1,800 service engineers who are members of ASTMS, but bargain independently of other ICL unions, are now threatening industrial action.

So far ICL has made a minor improvement to bonus payments, but according to Chris Ball, ASTMS officer for the ICL engineers, "this is not likely to be acceptable".

In the meantime, ASTMS is balloting the engineers by post over the proposal for a series of one-day strikes. If the proposal is carried and ICL fails to produce a better offer, "industrial action could apply from July 16", said Ball.

BARRATH..."A lot of government support."

To you, six months payment free — offer from Elbit

ELBIT Computers is banking on a six-month payment-free package backed by the Israeli government to encourage UK sales of its systems.

The Haifa-based manufacturer of mainframes, minicomputers, terminals and communication equipment will announce the deal in a few weeks time.

After the six-month free period customers will make 10 equal payments over the next five years at a 10% interest rate.

Elbit's UK managing director Yossi Barrath said the terms would be available for both dealers and end-users, and there would be no minimum purchase amount for buyers to qualify.

Barrath admits that Elbit gets a lot of government support, and that all computers scheduled for export receive a special subsidy. The Israeli government matches development costs of Elbit systems pound for pound.

Elbit has ambitious plans for the UK, which it considers the most important market in Europe, but it still has along way to go before it meets its "minimum target" of £10 million a year turnover. Last week it signed up GCS Engineering to provide third party maintenance for its existing installations in the UK, and GCS managing director Bill Nichols says he is convinced that it will be a lucrative deal for his company in the long term.

Elbit manufactures an IBM 4300 software compatible system, which has been sold in Europe by Nixdorf. The recent release in the UK by Nixdorf of its 8890 mainframe is based on Elbit hardware. But in spite of the new financing deal from Elbit, Barrath does not expect to be in much direct competition with Nixdorf.

Nixdorf, he says, is marketing the 8890 with its own operating system in the UK, while Elbit will go for the IBM market.

Barrath says Elbit is already working on a product which will be the basis of the next generation of Nixdorf mainframes.

Elbit had worldwide sales of $72.7 million and pre-tax losses of $953,000 in the year ending March 31, 1982, compared to 1981 sales of $61.9 million and pre-tax loss of $3.6 million.

SALES BRIEF

Honeywell wins $602m Navy order

HONEYWELL and Burroughs have won multi-million dollar contracts from the US armed forces for data processing equipment. The largest, for $602.9 million, was awarded to Honeywell by the Navy for 1,800 DPS-6 processors and peripherals to be supplied for shipboard administrative work over the next 10 years. The company also won a $46.8 million contract from the Army for business oriented systems for its bases in Europe.

Burroughs won a $144.4 million Air Force contract.

Midas touch

BIS SOFTWARE has made record sales worth £2 million of its banking and insurance systems Midas and Folio during its first quarter this year, with Midas sales in Europe, the Middle East and Africa accounting for nearly half. It has sold 250 Midas systems worldwide since 1976.

Million drives

CALIFORNIA based Tandon, which claims it will this year become the first manufacturer to deliver a million 5¼-inch floppy disc drives, has won two orders which together exceed last year's total sales of $54 million. The first, from VDU maker TeleVideo Systems, is for $43 million worth of floppy and Winchester disc drives to be delivered over the next two years. A second $37 million order from an anonymous small computer manufacturer is to be fulfilled within the next six months.

Irish choice

SEVEN car dealers in Eire have installed Wang 2200 small business computers running motor traders' software supplied through the Dublin office of Kerridge Computer Company. The whole deal is worth about £500,000.

Motor Deal

LONDON-BASED UK subsidiary of MAI has made a sale of its Deal business system for motor traders to White Brothers Contract Hire of Taunton. The system will run on a Basic Four 210 mini and its functions will include accounting with audit trails and immediate posting to all ledgers, vehicle billing histories, payroll and word processing.

Italian viewdata

ITALIAN Post Office has ordered 200 UK-made viewdata terminals, costing about £200,000, from Philips for use in a public viewdata trial. They are all 14-inch colour business terminals with alphanumeric keyboards. Philips is already exporting terminals for viewdata trials in countries including France, North America, Australia and South Africa.

Councils' system

SWANSEA-BASED local government software specialists Business Micro Systems has made five sales of its system, to Swansea, Stoke-on-Trent, Gloucester, Tewkesbury and Carmarthen Council. Totalling £200,000 in value, the systems all run on Digico M168 or M28 minis and are used for direct labour organisation accounting, word processing, handling planning applications and providing links to ICL and Honeywell mainframes.

NCR for Swiss

SWISS Bank International has installed an NCR V-9040 in its London office to support its dealing activities in syndicated loans and international securities such as Euorbonds. The machine will share peripherals with an existing NCR 9430 which is now used for development work.

Govt may help with high-tech premises

by Our Parliamentary Correspondent

NATIONAL and local government are to tackle the problem of attracting high technology companies to the UK.

John MacGregor, junior Industry Minister, told the Commons that the question of providing suitable premises for international high technology companies was being considered both in the private and public sectors with the aim of making sure that these companies came to the UK.

He was responding to a question from Dudley Smith, MP, who grilled the government about evidence that these companies were unable to find suitable premises in Britain and were being forced to set up on the Continent.

Smith pointed out that the fastest growing sector of British high technology industry was in companies employing under 100 people and asked if the government had considered helping these companies to find accommodation, particularly in the Home Counties.

And he urged the government to take steps to ensure that foreign companies in high technology were encouraged to set up in the UK.

MacGregor said that the traditional sort of industrial estate was not best suited for the new campus style developments favoured by the high technology companies. Both local authorities and new town authorities were moving towards the provision of premises suitable for offices or for high technology manufacturing.

This was often being done in collaboration with universities, he said, and claimed that science parks comparable with anything available in Europe were now on offer in the UK.

MacGregor added that the question of whether or not current planning procedures might inhibit this type of development was under consideration.

A Computer Weekly survey carried out with chartered surveyors Herring Son & Daw earlier this year revealed that 64% of the computer companies polled claimed that there was a lack of suitable buildings for their expansion in the UK.

Disc firms seek new ways to record data

by Kevan Pearson

THE latest generation of disc drives as typified by IBM's 3380 and rival products could be the last of their kind as disc manufacturers seek new ways of recording data.

The new systems will record into rather than along the disc surface and will use magnets arranged side by side.

The present generation of large scale disc drives are the culmination of 20 years of development in conventional recording techniques, which use a longitudinal magnetising method.

The crunch has come for conventional systems because of the rocketing demand for more memory to be crammed into a smaller space, since the physical size of most DP departments is fixed. The new perpendicular recording method allows much higher densities than the old system. This is imperative given the burgeoning demand of disc memory as witnessed by the furore over the non-appearance of IBM's large scale 3380.

The problem with the existing disc drives is that to achieve the best design of magnetic recording pattern on the ferrite platter the layer of magnetic coating has to be very thin. This has led to severe problems as the magnetic coating is prone to come away from the base, again one of the difficulties IBM had in getting its 3380 into production. It also limits the bit density of discs to, at present, between 10,000 and 15,000 bits per inch.

Even if the magnetic coating remains intact its thinness can lead to a significantly higher error rate because of the inherent weakness in the magnetic signal.

The proponents of perpendicular recording, where the data is recorded into the magnetic material rather than along it, claim that the new method will allow bit densities, or flux reversal densities as they prefer to call them, of over 100,000 per inch, or between six and 10 times the level currently available.

However, the new method is not without its own problems. One is the sophisticated alloy of chromium and cobalt which is used as the magnetic medium.

FIFTH GENERATION — 1

More than 200 delegates met in London last week to discuss the fifth generation of computers... Our staff report

Japanese report seen as a 'technological Mein Kampf'

by Kevin Cahill

THE first full-scale Western conference to consider the Japanese fifth generation computer project got off to a controversial start. The project was described as a threat, and the report on it as a "technological Mein Kampf."

Conference chairman Alex d'Agapeyeff who so described the Japanese endeavour, went on to summarise his gloom-laden reaction by calling the project a "Computing Apocalypse".

The Japanese project, now known inside Japan as the Knowledge Information Processing System, or KIPS, is fundamentally a user-driven attempt to make the next generation of computers serve user ends, and solve real problems.

The central objective of the Japanese project, to which a representative collection of the world's technologists has been invited as participants, is to devise a mainframe series which will be self-programming.

By structuring the new architecture around a CPU of 1,000 processors which is interfaced to a speech and natural language input/output interface, and with instantaneous access to a 100-gigabyte universal database, the Japanese hope that when you ask their future computer a question, you get an answer, not an invitation to rewrite the question in Cobol.

Describing the project as a brilliant marketing strategy by the Japanese, Professor Ed Feigenbaum, of Stanford University, US, said that the Japanese were picking an economic point beyond the view of IBM and US companies.

In doing so he felt that they were expressing a view of computing in the 1990s which was shared by many American users and venture capitalists.

Feigenbaum added that the Japanese have correctly spotted the beginning of the age of machines which engage in symbolic manipulation, and not numeric computation. The selection of technologies — array processing non-von Neumann architecture, VLSI — were also good, and likely to yield the desired result. Adding to this the quality of Japanese engineers and their speed at learning, Feigenbaum seemed convinced that the Japanese would make it.

But there were risks, Feigenbaum suggested: "Despite the level of engineering technology involved, the project is based on software, and Japanese managers are not comfortable with software; the project is very ambitious in terms of the state of current knowledge and carries great risk, a position which Japanese managers are normally averse to; nor is there a lot of in-depth knowledge engineering experience in Japan, and that will be a significant handicap," he said, "but 10 years in this industry is a long time."

Feigenbaum suggested that if the Japanese achieved only 20% of their goals, they would still wind up ahead of the game.

"As long as they are on the right vector and on the right course, it does not even matter if they miss their speed goals by orders of magnitude, they will still have a major lead on American companies."

d'AGAPEYEFF . . . He called the project a Computing Apocalypse.

FEIGENBAUM . . . Convinced the Japanese will make it.

by Kevin Cahill

MYTHS about the Japanese and their fifth generation project were exploded by Philip Treleaven, professor of computing at Newcastle University, at last week's London conference.

The Japanese have a clear idea of what the project itself is, he said, although some commentators have suggested that either the project is a "dummy" pass to divert attention away from what the Japanese are actually doing, or that it is speculative.

Treleaven and Ed Feigenbaum of Stanford University, both agreed that the image of the fifth generation computer was clear, and probably attainable.

According to Treleaven, it was not definite that the Prolog language would be used.

Prolog is a relatively new computer language, based on statements in formal logic similar to the preposition, If A then A.

Its proponents claim that it can solve problems, particularly in scientific areas, which could not previously be solved using conventional languages such as Fortran.

Its potential importance in the Japanese project is that it appears to fill the gap between the natural language interface and the machine processes themselves, a gap for which there is no other apparent solution at the moment.

Prolog was first implemented in France in 1972 and is widely used in Hungary, mostly for scientific applications.

Confirmation of Prolog for the fifth generation machines has a central bearing on whether the Japanese will use existing semi-inferential software such as Fortran, or try to develop their own. There is grave doubt in many circles as to whether any existing computer languages can serve a function in the 1990s.

The use of Prolog would certainly imply that moves to make Cobol obsolete were under way.

Objections that the existing investment in programs written in conventional programming languages was so great that it would not be abandoned, were swept aside by several speakers.

Languages like Cobol were tools to solve problems, as were the programs written in those languages. If better tools came along, most speakers seemed to think they would be adopted without much regard to the existing user base of programmers in conventional languages.

Ability to see it through

According to Treleaven, the Japanese working on the project have an adequate knowledge of artificial intelligence research to achieve the logical inference functions required of the eventual central mainframe processor, and the interface devices.

The innovations required to achieve the device were well within the capabilities of Japanese computer scientists who could, contrary to popular wisdom, innovate as well as the rest in the world.

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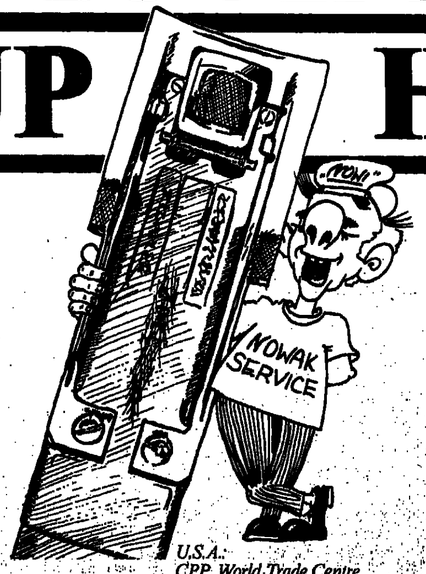

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‘Mankind undermined by false information’ fear

by Philip Hunter

MUCH more emphasis must be placed on research into software technology if the Japanese fifth generation project is to succeed. In a paper to the SPL fifth generation conference in London warning of the dangers of concentrating too much on hardware and social objectives, Professor Manny Lehman, of Imperial College London, pointed out that the problem of producing and maintaining cost-effective software has plagued the computer industry since its inception.

This problem would increase with the advent of new complex fifth generation hardware architectures unless a great effort was devoted to coming to terms with the new complexity of the software that would be required.

“Mankind will be gradually, insidiously, undermined by an accumulation of incorrect information that could even lead to the complete destruction of society as we know it,” he said.

The published fifth generation plan made passing reference to simple verification of programs, but completely ignored the biggest problem with all software – the issue of correctness, he added.

Lehman also criticised pioneers of expert system for fostering the belief that they are a panacea for all problems. “Expert systems feed the tendency to believe what the computer tells us is gospel,” he said.

Lehman claimed that HMS Sheffield was sunk in the Falklands war because an expert system had failed to detect the lethal Exocet missile.

“The system was told Exocet was a friendly missile,” he said.

Lehman was talking of the rule-based expert systems such as are sold by SPL, which sponsored and organised the conference. “I would place an equal or higher priority on software systems engineering than on rule-based software,” he said.

The theme of Lehman’s paper was echoed more meekly by other speakers. It was agreed that more money would have to be found for research into software techniques to come to terms with the challenge presented by new hardware architectures.

Michael Duff, of University College London, complained that some of this vital research was being undermined by an anomaly in the way grants are allocated. “A person who makes a proposal for a research contract may not charge his time to that contract,” he said.

In a panel discussion, Professor Donald Michie, regarded by some as the founder of rule-based expert systems, ignored Lehman’s criticism of his beloved subject, and urged that his comments be seriously considered. “I hope Manny Lehman’s eloquent remarks earlier will stimulate an improvement in communications between the various people involved,” he said.

In a speech at the conference reception, Information Technology Minister Kenneth Baker gave a hint that the government might be able to find some of the money urgently needed to meet the Japanese threat. “I hope to have some proposals to put in September,” he said.

STEFIK . . . Divide and conquer is the key.

‘Machine takes 20secs to do what humans can do in a millisecond’

by Claire Gooding

MACHINE speed is still one of the biggest problems facing researchers who are working on “knowledge machines”.

“Programs have no quick way of finding relevant knowledge,” said Danny Hillis of the Artificial Intelligence Laboratory at Stanford, speaking at the fifth generation conference. “Humans do it in a flash, but right now it takes 20 seconds to do something on a machine which humans do in a millisecond.”

The paradox of present research, said Hillis, was that machines were getting slower as they built up knowledge systems. In Stanford there is a project, known as the Communication Machine, designed to crack the problem of speed by dispersing knowledge between a mass of specialised processors.

“The trick is to design a network where messages can be sent very quickly,” said Hillis. “Each node in the network has knowledge on one subject, and the addresses of others with information on related subjects. It is not out of the range of possibility to have a machine with a million processors on it.”

The Stanford team working on the Communication Machine has reached the point where there should be a knowledge network operating with 100 or so nodes, by this time next year.

The system would deal initially with knowledge manipulation such as recognising algorithms, drawing analogies, and making commonsense deductions without difficulty.

The Communication Machine fits in with other fifth generation work on speech, vision, knowledge bases and robotics.

“The biggest obstacles facing the development of these machines are communications, packaging, fault tolerance, and testability,” said Hillis.

VLSI chip of the future

by Philip Hunter

THE Japanese fifth generation project was criticised by some delegates for failing to address the whole spectrum of computer development. But this criticism could not fairly be levelled at the conference itself, which covered software engineering, expert systems, natural language developments and hardware configurations.

There was only one paper speculating about developments inside the VLSI chip, given by Mark Stefik, of Xerox Palo Alto Research Centre, US.

Stefik described how a hierarchy of designs on the chip could be implemented to perform forks, joins and other operations. “The principle of divide and conquer is an essential part of mastering otherwise overwhelming tasks,” he said.

Stefik emphasised that his approach differed from the so-called silicon compilers, in which the behaviour of the chip is specified at just one level.

Silicon compilers fail to exploit many design possibilities, he said.

So far, Stefik’s team at Palo Alto has completed some preliminary experiments with hand-worked examples, which, he said, suggest that great savings of time and space could be made by putting software into a chip. The question is whether this approach will make a significant contribution to the vast time and space cuts that various speakers agreed will have to be made to maintain the momentum of the computer industry.

Hardware for ideal 5th generation machine

by Philip Hunter

DELEGATES to the SPL fifth generation conference were bombarded with possible hardware configurations for the ideal fifth generation machine, and many must have come away more confused than when they arrived. But at least one paper, by Philip Treleaven of Newcastle University, made an attempt to reconcile the various approaches.

“I believe in a system architecture embodying special purpose computers like dataflow and reduction machines,” said Treleaven. Each computer could itself contain several hardware arrangements to suit particular different applications, he added.

Treleaven described the three types of hardware that had been investigated by his architecture research group at Newcastle. These are dataflow, control flow and reduction.

TRELEAVEN . . . Room for several hardware architectures in the ideal fifth generation system.

Treleaven believes all three approaches should be implemented in a single system because each one works very well on some applications while floundering on others.

In general, control flow is good for processing large data structures where the same values may be used many times, but not so good for evaluating strings of simple arithmetic expressions.

Dataflow and reduction work well for evaluating large numbers of relatively simple arithmetic expressions, but are less successful than control flows on large data structures.

But one form of reduction, called graph reduction, holds some promise for attacking large data structures.

Dataflow and reduction embody no concept of data storage. With dataflow, execution is tied to the data as it comes off the input device. For example, an arithmetic expression is evaluated when and only when all the necessary data have arrived.

A dataflow program can therefore be executed while input is still coming in, and could work well with ICL’s Content Addressable File Store (CAFS) controller, which enables data to be selected at the speed it comes off disc.

Control flow differs from dataflow and reduction in that there is no movement of data once it has been read in. Unlike dataflow, where tokens tell data items where to go, control flow uses tokens to specify what action is to be performed on data items.

Goals of the fifth generation

by Kevin Cahill

THREE years ago the Japanese commercial and academic community, under the guidance of the Ministry of International Trade and Industry, set up a series of committees to consider the contribution of high technology to the solution of Japan’s perceived social and economic problems towards the end of this century; and the role that Japanese computers and technology should play in the fifth generation of computers.

The culmination of the first stage of the project as it was set up in Japan took place at an international conference in Toyko last October.

The conference to which most Western nations and many commercial organisations such as IBM sent delegates, received a preliminary report which summarised the Japanese work for the first two-and-a-half years of the project.

The report reiterated the Japanese invitation to foreign commercial and governmental organisations to join Japan in building the fifth generation machines, and began by defining the strategic problems which the Japanese expected the technology to solve.

Summarised these were:

- To increase productivity in low productivity areas, such as agriculture, fishing, distribution and the public services.
- To help Japan meet international competition and at the same time to enable Japan to make a significant contribution to international co-operation.
- To assist in saving energy.

Following the general social goals, the report then set out a series of functional requirements for the technology. These were:

- A man machine interface at the input output level, which would operate on spoken languages, graphics, images and documents.
- The conversion of stored information into practical use.
- The ability to perform inferential logic operations, as well as process data conventionally.
- To eliminate, from an end user point of view, the use of most current programming languages.

This led to an outline concept of what the final machine would look like. It would be based on non-von Neumann architecture, running at about 1,000 million [illegible] hardware would be built on VLSI technology and contain about [illegible] VLSI processing elements.

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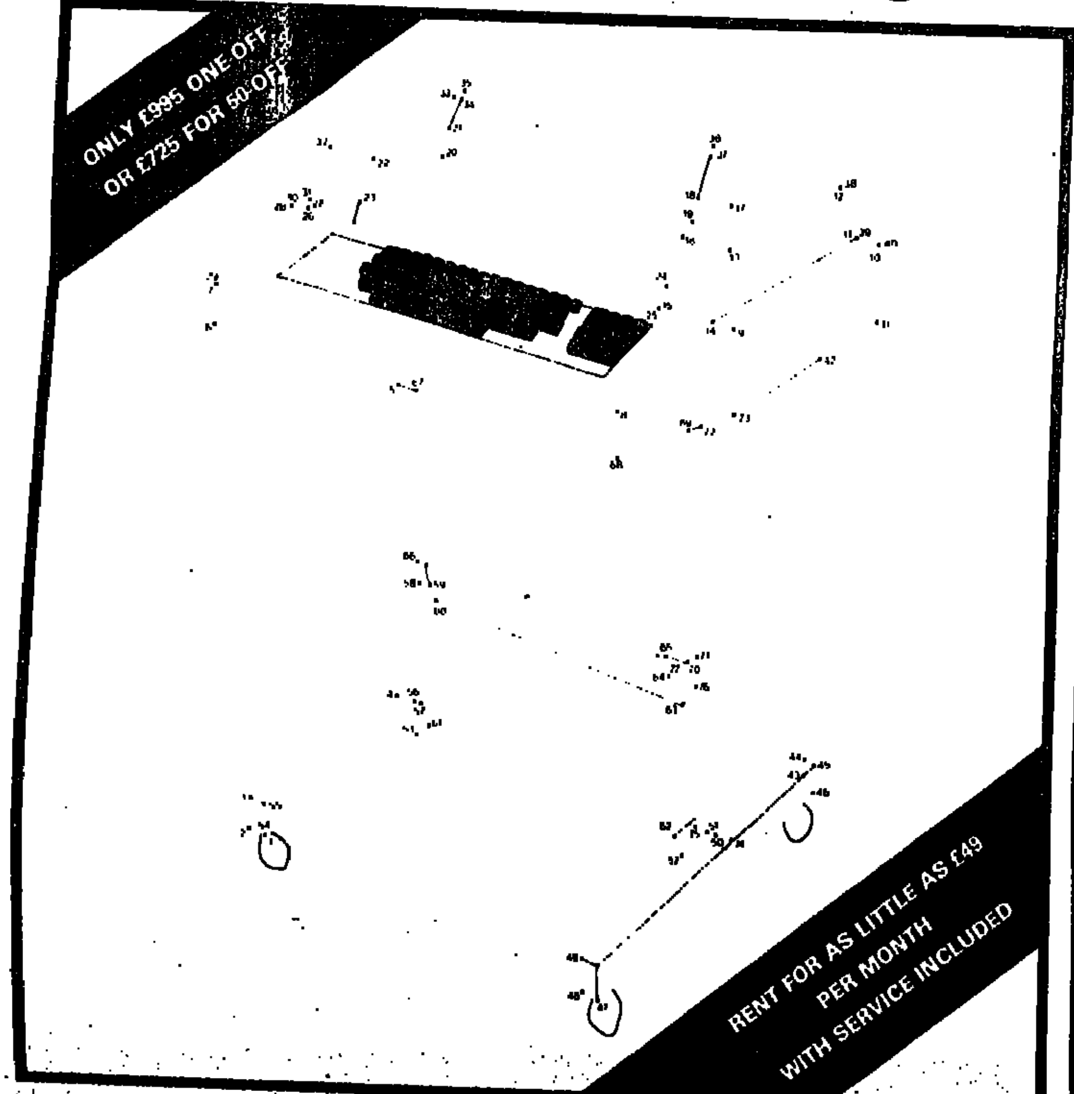

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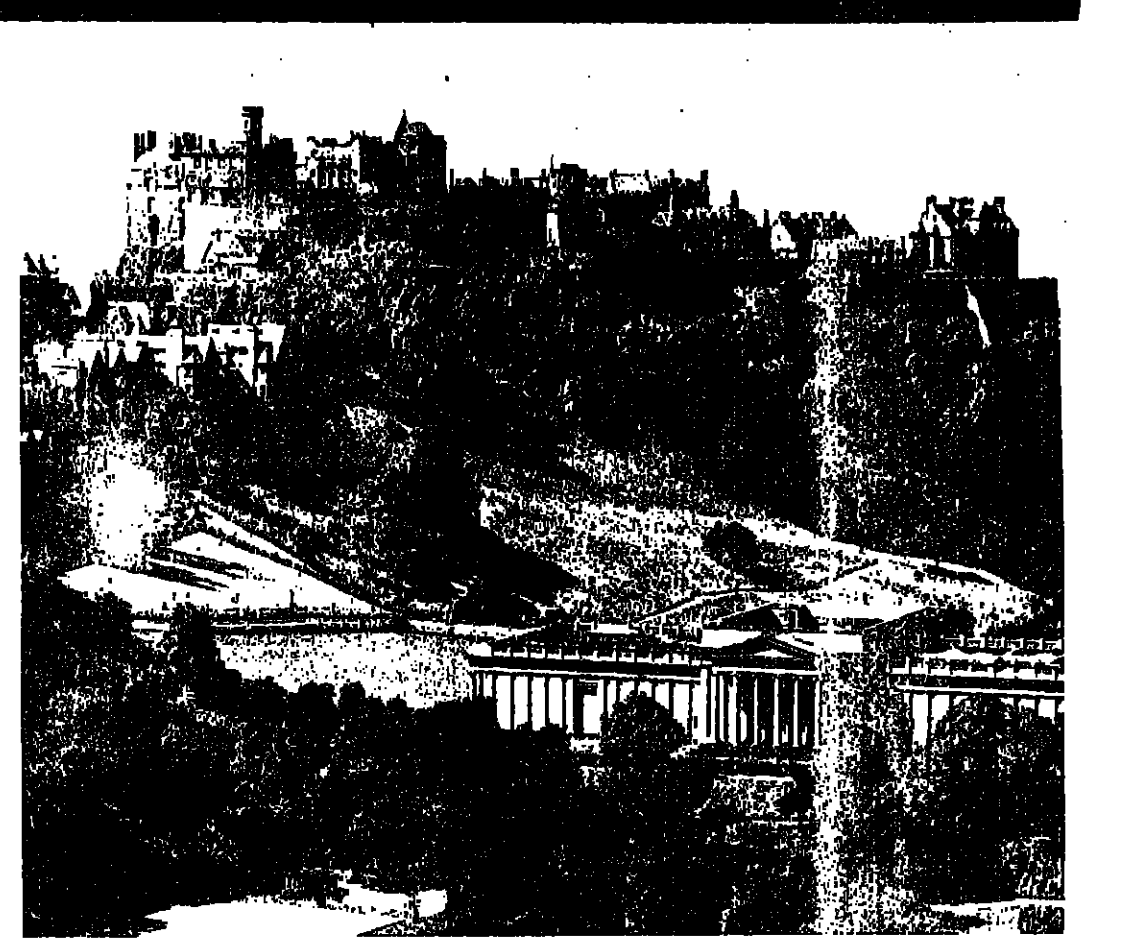
In London the ideas were aired . . . in Edinburgh the practical people thrashed out their problems

Can the chip engineers come up with the goods to match the concepts?



Will the hardware solutions to the problems of “knowledge engineering” appear in Edinburgh?

by Hedley Voysey

ALL the amazing ideas represented in fifth generation feats of “knowledge engineering” will never come to pass, except for the very rich, unless design engineers produce the machines to match the concepts. That was the impression gained at last week’s workshop for top chip designers in Edinburgh.

Peter Hart heads the Fairchild Laboratory for Artificial Intelligence Research. Formerly he led the team at SRI International that made significant progress in edging AI from the realm of theoretical possibilities towards practical progress, including a working vision system for certain types of application.

Hart notes that “Along with the general problem of conceptual complexity, we face the problem that our programs have apparently unbounded appetities for cycles and memory. The computational demands made by AI programs make it natural to consider whether VLSI-based architectures can be developed for ‘AI-style’ computation. Of specific interest would be architectures that provide high levels of concurrency.”

This shows the link between Very Large Scale Integration efforts in design and the AI world very clearly. The key words are hammered at all the time by both sides of the fifth generation equation – the AI method builders and the computational superchargers.

Carver Mead, from the California Institute of Technology, who with Lynn Conway of Xerox’s Palo Alto Research Centre wrote the book that set out the new methods of designing in VLSI, states that the entire problem of VLSI is “a challenge in complexity.”

Part of the challenge is understood in principle. There are some “regular” patterns of computing which can be parcelled out on a divide-and-conquer basis to speed up the computations by doing things in parallel. The existing example is in vision work, and parts of speech recognition.

In both of these areas the captured signals can be sent in automatically delegated squadrons through networks of small specialist signal processing units. All types of regular designs for such concurrent computations are being tried out. At Carnegie-Mellon University HT Kung has a well studied and developed system labelled “systolic arrays” where the processing flows through leaf structures and the total number of instructions executed per second runs into the range of 10 to 160 million.

> ‘AI workers have not stood still and the ideas used by them for tackling problems keep moving on’

KOWALSKI . . . Algorithm is equal to Logic plus Control.

This pace should enable some selected pattern recognition tasks to be done in the time available, which for many vision tasks is just a few milliseconds. However, while these regularly organised and automatically delegatable functions can be processed by suitably massed processor designs, the AI world has a need for coping with computational overloads which are not so nicely fashioned.

Most of these pieces of knowledge engineering which deal with more than a toy database of knowledge need much more computing power if they are to be widely used and extended in scope. The workhorse of much of the AI field is Lisp as a programming culture. For most of the Seventies this tended to be based on the larger Digital Equipment series 10 machines, and nowadays eats hefty sized VAX machines.

One outgrowth of this culture has been special purpose Lisp engines from Lisp Machine and Symbolics. In addition to these commercial designs there are research studies to provide greater Interlisp (interactive) personal computing power and so on.

But AI workers have not stood still and the ideas used by them for tackling problems, their description and representation, both symbolically and as machine handable pieces, keep moving on. At this point the two complexity issues, that of VLSI design and AI problem solving techniques meet arm-in-arm.

Some AI workers believe that AI can help solve some of the VLSI design issues.

The newest machines for the fifth generation all try to exploit as much concurrent, parallel computation as can be squeezed out of a strategy for problem solving. This happens to mean using new classes of programming languages for best results, although it is possible to use existing ones.

To check whether the solution really works via parallel computations often means doing a mass of theorem proving; often this is supported by machine theorem provers. Once again the worlds of AI and predictable engineering in VLSI settle on the same intellectual patch of tasks.

The splendid text on logic as a programming tool produced by Robert Kowalski of Imperial College, maintains that an “Algorithm is equal to Logic plus Control”. It should be understood that control in this sense may be a whole mass of context to provide “meaning” to refine the “logic”.

The strength of the Kowalski proposition is very much a matter for debate, and it has been debated for the last eight years since he enunciated it. But to all those involved in this discussion there is no doubt about the support needed by computer architecture when the context, or control knowledge, is ramified in the extreme way that it seems to be in many AI-type problems.

Some AI workers maintain that the gauging of this ramification in context is exactly what separates an AI problem from run-of-the-mill data processing. In other words, we have become used to dealing with logic applied to data which can be treated as self-sufficient in meaning, like accounting data.

The interesting problems all mean being careful about applying logic in appropriate contexts. All this contextual stuff, whether expert rules or knowledge geared to the concepts of that particular problem which is in hand at the time, has to be on hand somewhere – which is both a storage and a processing problem. So once more we are all back waiting for computer architects to provide a “machine for learning” in VLSI driven form.

The Japanese state that new machines are needed for data flow designs, which are machines which execute when the operands arrive rather than rush about fetching the operands (hence the name), and also database machines which can add deduction and inferencing powers to use databases which are really general forms of knowledge store, as well as pattern processing units for vision and speech.

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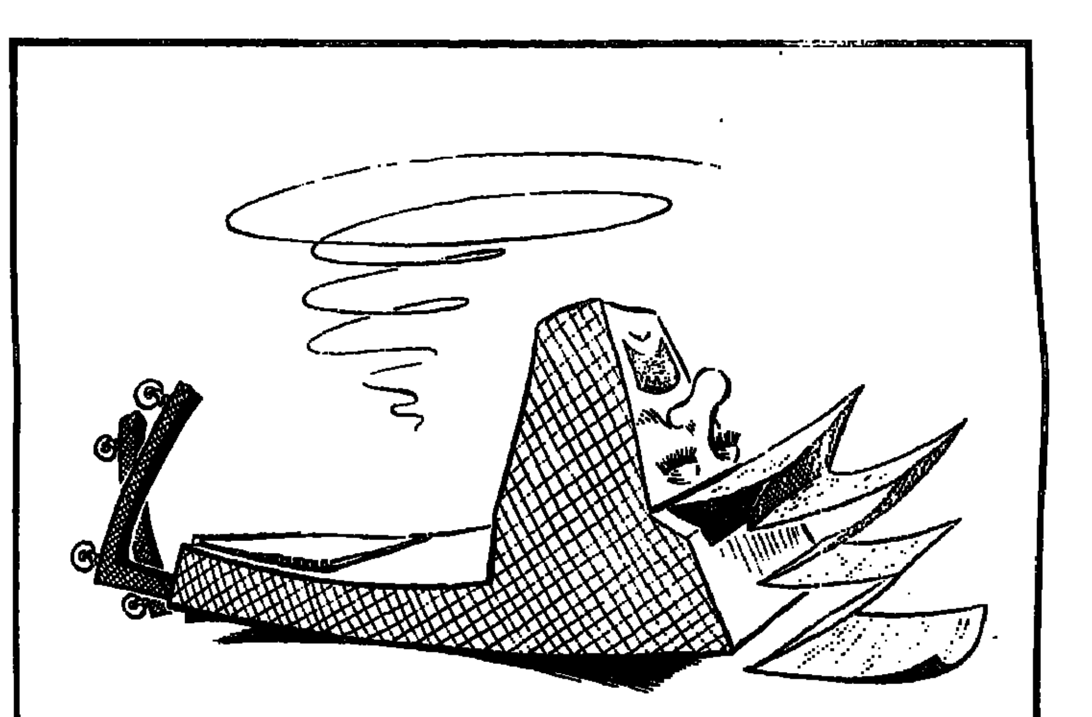

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CAP in Trader Point despite dealers' doubts

CAP has signed an enhanced Trader Point agreement with ICL, despite concern among other Trader Point dealers over ICL's operation of the scheme.

The agreement between CAP and ICL has been described as "collaborative", and is not specific to any particular product. ICL and CAP have worked together in the past on many projects, including that of British Defence Software, which is a consortium of defence information technology suppliers.

CAP sees the agreement as covering a number of projects, not necessarily all within the UK, and says that it is examining a number of joint efforts that will shortly be announced under this umbrella.

Representatives of CAP who attended the Computing Services Association joint seminar with ICL last month, however, expressed doubts about the way ICL was putting Trader Point into operation, a view echoed by delegates from other companies.

"We are considering Trader Point at the moment, because we market human resource systems based on IBM equipment, which could be converted to run on ICL's as a joint conversion and marketing exercise with ICL," said Jeff England of IAL Gemini.

"In a discussion with ICL at the seminar about how far local salesmen will decide which Trader Point dealer can best serve the customer, ICL seemed undecided about whether the salesman would offer the customer the full choice of software available," he said.

This was confirmed by Stephen Valdez, marketing director of Data Sciences International, a company which is also about to sign a Trader Point agreement.

"It was an opportunity to put cards on the table and ask frank questions, such as: If an item of software appears three times in ICL's catalogue, with ICL in competition, is the customer left to choose" said Valdez. "ICL said that if it has an appropriate piece of software, it will try to sell that and yet must protect its own salesmen, who get commission on software sales."

ICL recently also went against the spirit of the Trader Point agreement by purchasing application software from Systemsolve in order to please a customer ordering an ME29, who wanted ICL to take sole responsibility.

ELSE . . . *Looking for "additionality".*

by Maggie McLening

Govt aid plans may exclude small firms

SMALLER software houses may miss out on government funds to aid development if qualification rules for the Software Products Scheme are not relaxed.

Under the scheme, the Department of Industry is to provide £10 million in grants to help British companies produce innovative software with good export potential. But there are two stumbling blocks for small companies: work must not have been started prior to approval of the application; and approval itself might take up to three months.

Companies wishing to apply for a grant are asked to submit a 30-page proposal to the National Computing Centre outlining their plans, and showing how they propose to capture a share of the market.

Three weeks after sending in the proposal, they will be invited to give a presentation, an assessment of which will go to David Fairbairn, NCC head, who will send a recommendation to the Department of Industry. He may also ask for advice from members of the SPS Advisory Committee drawn from the DoI, NCC and Computing Services Association.

"I think the rules will have to be slackened for the scheme to work, because the timescales are much too long," said Avis Clarke, a consultant with Micro Scope software house. "We will probably submit a rough proposal to get some idea of what chance we've got, to avoid wasting any time."

This was a view shared by David Butland, manager of Bradford University Software Services. "It's quite reasonable that people should be asked to justify themselves for a grant, but having done that, what will they do for three months? The project may well lose its impetus," he said.

David Else, NCC scheme manager, told potential applicants that he was looking for specific qualities in applications. "We are placing emphasis on what I can only call 'additionality'," he said. "The use of government funds can only be justified if it gets you to do something you wouldn't otherwise have done, or to take a risk."

According to Butland, the timescales involved may have the reverse effect on the products.

"Small companies may be forced to go ahead with their really good ideas themselves simply because they are time critical, and apply for money for second-rate ideas that are always floating around, but you never quite get round to," he said.

Applicants to the scheme should note that grants of one third of the development cost will only be awarded until May 1983, when the proportion drops to 25%.

MSP turns to micros as intelligent terminals

MSP is to turn its attention to products using microcomputers, particularly the IBM Personal Computer, as intelligent terminals linked into mainframes.

MSP, which has subsidiaries in 18 countries and expects turnover to top the $20 million mark this year, supplies a range of Cobol development tools and design aids based around the concept of an all-controlling data dictionary. Initially, it is the Projectmanager utility that is under consideration for the IBM Personal Computer, but others may well be adapted.

"We are looking at the implications of the IBM PC and the Sinclair range, because they are all a means to an end. Microcomputers will permeate every level of computing, and we will have to be downwards compatible," said David Gomes da Costa, managing director of MSP.

The 52-strong research and development team at MSP is also working on a screen handling facility to front-end all the products, and help to control the profusion of screens generated within one organisation.

"It will be an interactive screen generator driven by the dictionary to enable the user to look at existing software, with complex indexation for an information bank," explained da Costa. "There will also be a full screen editor, and browse facilities."

While scornfully rejecting the Office of the Future concept as "an answer in search of a problem", he concedes that humans must "download some of their functionality into a microprocessor" in order to make any steps forward. The major problem of proliferating microcomputer systems he sees as one of data integrity and security.

"At the moment we are going through the same kind of industrial revolution that followed the 1971 recession," he said. "If we're not careful, all that will happen is that we shall become increasingly misinformed with more and more misinformation."

DA COSTA . . . *People must "download their functionality to a micro".*

A MATTER OF LIFE OR DEATH

When an accident occurs involving severe electric shock, people on the spot may be suffering from a kind of shock themselves. The realisation that one has literally only seconds to save a life can itself be momentarily paralysing.

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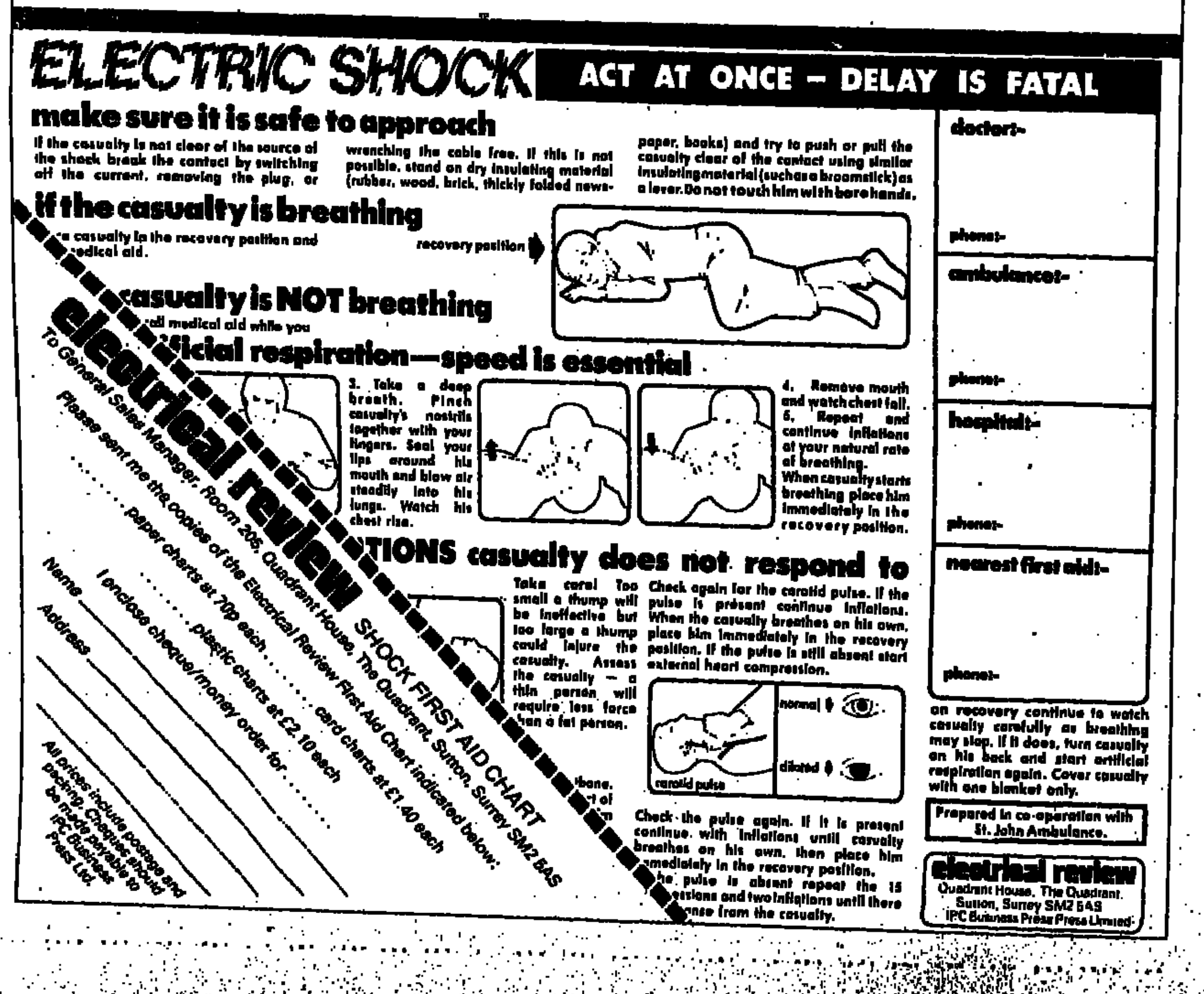


by Kevin Cahill

Accounting for the lost millions at National Enterprise Board

A LINGUIST once said that the purpose of language is not to communicate, but to conceal. He might have been talking specifically about the National Enterprise Board, which recently announced a loss of £56.2 million for the year 1981. But the full consolidated group accounts showed NEB's losses – that is money spent, and for one reason or another irrecoverable – as £44.1 million before tax.

The larger, £56 million figure was arrived at by combining investments and losses, which may make accounting sense, but must only be confusing for the majority of taxpayers whose money is lost or invested by the NEB.

What this appears to mean is that the NEB increased the apparent loss by taking two provisions: One was £12 million for Data Recording Instruments, and the other was a general provision, that is money which may have to be paid later, of £7.18 million against its general investments.

What this accounting fudge has done is to obscure the plain fact that the start-up costs at United Peripherals were almost £32m.

According to the NEB accounts, losses of £10.34 million at DRI in 1980, and further losses of £9.73 million, were primarily attributable to the costs of starting up the joint venture with Control Data Corp at Winsford.

What has appeared for the first time is an additional £12 million of stock write-offs occasioned by DRI's entry into the project.

The fact that so much public money can be spent without any detailed accounting explanation, or indeed advance estimates which would have enabled progress to be monitored, is unusual. According to Sir Frederick Wood, the chairman of the BTG Group which encompasses the NEB, UPL will be in profit in the next year or two.

The accounts also fail clearly to associate investments in the two companies, and the running losses paid, presumably, by the NEB.

Other heavy losers at the NEB were: Inmos, £15.11 million in 1981, compared with a £5.78 million loss in 1980; and Nexos the now defunct word processing venture, which lost £13.2 million in 1981 and £9.99 million in 1980.

64% profits slip at DG

by Kevan Pearson

PROBLEMS affecting Data General continue to have a depressing effect on the company's financial performance. Third quarter profits fell 64% to $3.5 billion compared with the same period last year. Sales were $145.4 billion, up $5 billion on the previous year.

At the three-quarter stage profits are down almost 42% to $19.2 billion. The company, once one of the fastest growing and most aggressive in the industry, has been stagnant for almost two years.

In 1981 it slipped one place to 12th in America's league table of computer sales. Profits last year slipped 7.4 per cent to $50 million on sales up 13.6% at $764 million – a rate of growth less than half that of the Digital Equipment, the industry leader.

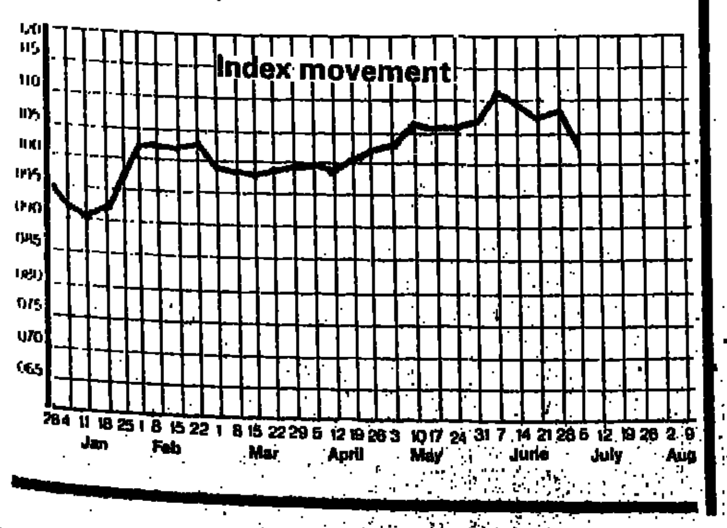
CW SHARES TABLE

Date 8/7/82 Index 103.77 Change – 4.22

Pence 1982 High	Low	London Stock Exchange Stock	Pence Price	C'nge
195	151	ACT (App Com) (25p)	188	+ 1
178	150	BOC Int. (25p)	162	– 6
79	18	B. Bav Kent (25p)	28	+ ½
127	101	Chubb (20p)	107	– 2
94	45	Cole Group (25p)	87	–
303	233	C.A.S.E. (20p)	267	– 1
730	445	De La Rue (25p)	465	+20
350	235	Emi (25p)	316	–
800	635	Ferranti (50p)	800	+67
1331	797	GEC (25p)	1031	+60
82	33	ICL (25p)	59	+ 1
47	41	Kalamazoo (10p)	44	–
310	223	Koda Int (25p)	280	+ 3
305	215	Mamec (10p)	266	+ 6
154	110	Muirhead (25p)	164	+ 6
284	218	N'market (1981) (6.06)	240	– 8
820	570	Norsk Data	690	–15
375	285	Office & Elect (25p)	378	+ 5
643	445	Philips Lamp (fl10)	482	– 3
428	348	Plessey (50p)	488	+18
97	25	Quest Auto (10p)	25	–32
456	363	Racal Elect (25p)	466	+ 6
250	171	Rediffusion (25p)	218	–10
468	356	Thorn-EMI (25p)	388	–14
90	74	UC&T (50p)	75	–
		OTHER MARKETS*		
90	80	Bus Corp (10p)	80	– 2
567	415	Comp Serv (£1)	481½	–
182	78	Consult (C&F) (10p)	174	+18
252	245	Io Tech (25p)	260	+ 3
60	60	Knight (5p)	60	–
121	112	Miles 33 (10p)	112	–
170	114½	NMW (£1)	114½	–11½
97	43	Rolls & Nolan (10p)	87	+ 3
120	78	ScanData (10p)	105	–10
217	180	Star Comp (10p)	217	–
105	83	Trident Comp (10p)	64	+ 1
110	78	Zygal Dyn (5p)	110	+10

$ 1982 High	Low	US Stock	$ Price	C'nge
29¼	18	Amdahl	18	– ½
20¾	11¼	Apple Inc	11¼	– 1½
28	22¾	Auto Data Pro	22¾	– 1¼
37¼	31	Burroughs	32¼	+ ¼
13¼	7¾	Comp Auto	8½	+ ½
18	11¾	Comp Sciences	12	–
16½	12¼	Comshare	12½	–
35½	23	Control Data	23¼	– ¼
36¼	21¾	Cray Research	23	– ¼
63¼	24¾	Data General	25½	+ ¾
49½	12	Datapoint	12	– ½
24½	16½	Dataproducts	17¼	–
87½	67½	Digital Equip	68¼	–
28	18¾	Elec Data Sys	25¾	– 1½
6½	3¾	Gen Automation	3¾	– ¼
38¾	22	Harris	24	– ½
48¼	38⅜	Hewlett-Packard	42	– ¾
76	63	Honeywell	66½	– ½
33¼	20⅞	Intel	29¼	+ 1¾
66	57	IBM	61¾	+ 1
56	38½	Litton Ind	41	– 1½
13¼	9¾	MDS (Mohawk D)	11½	–
24	18	MSA (Mgmnt Sci)	21½	– 1
18¾	10	Mngmnt Assist	10¼	–
8¾	6⅞	Modular	7¾	– ⅛
65	60¼	Motorola	61¼	+ ¼
24½	16¾	National Semi	20¾	+ ¼
54	40½	NCR	61¾	– ¼
28¾	17¼	Perkin-Elmer	18	+ ¼
23⅞	18½	Prime	17½	+ 1
38¾	28¾	Raytheon	38¾	+ 3¼
28¼	18¾	Signal	17⅞	+ 1½
34	21⅞	Sperry Comp	21¾	–
34½	20¼	Storage Tech	21	+ ¾
29½	18	Tandem	18	– 1½
35	27	Tandy	29	+ 1½
83	70¼	Texas Inst	86½	+ ½
27¼	12½	Tymshare	14¼	+ 1⅜
38¾	27	Wang Lab B	27	– ½
9½	7½	Wyly	9¼	+ ¼

The table shows the closing prices on Thursday. The Share Index is based on the prices of the UK companies in the table. Highs and Lows have been adjusted where necessary.
**Shares traded on the Unlisted Securities Market or under Rule 163(2)(a).*



SCHROF . . . *Used government scheme for high initial borrowings.*

Banks too cautious when start-up firms need help

PROFITABLE companies overtrade, but British banks are still unable to adjust their cautious lending policies to meet the needs of new technology start-up companies that are short of cash.

This was one of the messages from the first provincial computer industry financing conference which was held near Reading last week by stockbrokers Heseltine Moss.

The event, in the intimate surroundings of an elegant country club, once again brought together a group of financiers with money to lend to computer companies, and a small gathering of computer companies which had either just started up or were seeking their second round of initial financing.

One measure of the effectiveness of the conference was the departure of one small company representative with a promise of £100,000 from one of the financing participants.

The conference itself, addressed by a series of speakers from both sides of the fence, managed to raise a number of thorny and central questions about financing in the UK.

According to several speakers, particularly from the industry side, one of the major failings on the part of the banks was the inability to adjust to the cash shortage raised by rapid sales expansion. Traditionally, UK banks and lending institutions are very cautious when it comes to funding companies which may be technically overtrading.

In effect the companies are selling more product than can be financed by their cash flow, and consequently a need for further borrowings is created. That in turn may lead to an increase in "gearing" – the ralationship between a company's borrowing and its shareholders' funds.

But one delegate said he had never come across a profitable company which did not overtrade. It was the cheapest form of borrowing, letting your suppliers fund you interest free.

The discussion led to a spirited defence of the banking industry's current position by Colin Amies, Midland Bank corporate finance director. He said there was no shortage of funds for companies which were trading successfully.

For a good proposition, Amies said, his bank would always be able to make an offer of funds. A good proposition was one which came with a complete team covering marketing, technical matters, production and finance, with an in-depth knowledge of the market they were entering.

Raul Schrof of Scribe and Naomi Langford Wood of PME, who have recently started up computer companies, were both appreciative of the help they had received from their banks, Lloyds and Barclays.

Schrof said that he and his fellow directors had used the government guarantee scheme to raise quite high borrowings initially.

This enabled them to hold on to all the equity until it, and the company, were worth enough to consider selling some shares for the kind of money which would launch the company into the marketing phase of its development.

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Easy-wipe PROMs lead on to self-programming systems

by Robert Parry

MOST of the interest in semiconductor memories has centred lately around 64K dynamic RAMs and their imminent 256K big brothers. While the 64K chips are now starting to appear in quantity and with higher performance, and appear to be on the way to becoming the first semiconductor market sector to break the billion-dollar barrier, things are happening in other parts of the memory world too.

One area likely to be extremely important in the future, certainly in Intel's view says northern European memory marketing manager Tom Sennhauser, is electrically erasable PROMs – EEPROMs. These are programmable ROMs that can be reprogrammed using a voltage pulse, rather than needing to be exposed to UV light to erase the memory contents.

Present devices available in quantity require externally generated high voltage pulses for altering date and extra circuitry to hold the address and data signals.

But recent developments are changing this. Both Seeq Technology and Xicor have parts needing only a 5-volt power supply and incorporating some or all of the latches and timing circuits on the chip. This will make the chips much easier to build into microprocessor systems.

Intel, which is the only company shipping in volume, says Sennhauser, has its 2817, which only needs a timing capacitor and a steady 21-volt supply. Its earlier part, the 2816, needs an externally produced shaped pulse. A 5-volt-only part is on its way "in the near future" adds Sennhauser, to be called the 2817A. All these devices are 16K parts.

Costs are falling fast too, and Intel reckons that in 1984 the 2816 EEPROM and 2716 EPROM prices will cross over. This will only happen for this 16K device – which Intel is shipping in tens of thousands a month and which is second sourced by National Semiconductor and Motorola.

Japanese manufacturers – dominant in other memory market sectors – do not feature in the EEPROM stakes yet. Hitachi did have a part, but has withdrawn from the market for the moment to redesign it to a standard pin-out, says Sennhauser.

Reasons for the importance of these devices range from the rather mundane, though most obviously financially valuable, reason of giving non-volatile memory that can be altered remotely, to the more exciting prospect of self-programmable systems, able to adapt to changing circumstances.

Because an EEPROM only requires an electrical signal to alter the information it contains, the chips do not have to be removed from the system to change the firmware. Changes can be made from keyboards, down phone lines, and so on while the chips are in situ, unlike normal EPROMs which have to be taken out of the system and erased under UV light before reprogramming.

Costs of sending trained personnel out into the field to get into systems and take out or replace the EPROMs are rising, and will continue to increase dramatically, says Sennhauser, and users will be better off going to EEPROMs if firmware is changed in a system more than once a year.

Typical applications to benefit from this sort of EEPROM use as straight replacement for EPROMs include point of sale systems, where price information needs to be updated regularly, and in patched programming – where a branch table contains jump instructions fixing a sequence of subroutines to make up the main program. Putting the branch table in EEPROM rather than EPROM will greatly ease changing it, and thus the program itself.

Potential applications in self-adapting systems are most likely to come first in the industrial control area. Machines will be made self-calibrating, taking into account wear and changing tolerances and altering firmware as appropriate.

CHALKE . . . Aimed at multi-user applications.

Top-end Rair release

BRITISH microcomputer manufacturer Rair has extended its range of micros upwards. A new top-end system, the Black Box 3/50, gives a faster running speed and a greater memory capacity than the 3/30, Rair's previous top machine, also sold by ICL as its Personal Computer.

The Intel 8085 microprocessor is retained, but now runs at 5 MHz rather than 3 MHz, giving the 3/50 a speed increase of nearly 70% over the 3/30. Memory can now be expanded to one Mbyte – double that of the 3/30 – through using 64K RAM chips. Up to four memory boards, each carrying 256 Kbytes, can be fitted.

The 3/50 is aimed at multi-user applications, says sales manager Roger Chalke, where higher processing speeds are significant. The machine runs under MP/M II, the multiple-user operating system, as well as Rair's CP/M-plus.

Prices of the 3/50 start at £6,500 for single units to end users, with deliveries from stock.

Rair unveiled a departure from its 8-bit Black Box range at last month's National Computer Conference in Houston. This moves even further upwards in performance than the Black Box 3/50, and is thought to use the 8/18-bit 8088 microprocessor from Intel.

DEC support for upgrade board

A MICROPROCESSOR based printer upgrade board has gained maintenance support from DEC after three years in the market and UK sales of over 1,000.

The DS120 board from US company Datasouth, distributed in the UK by Northampton-based Datatrade, upgrades DEC's LA36 DECwriter II and now comes with a three-month on-site warranty from DEC. Maintenance for the LA36/DS120 combination is available from DEC throughout the UK and Eire.

The board was developed in 1979, and has world-wide sales of more than 6,000 units. It gives the LA36 increased throughput, from 30 characters per second to 165, with most of the features of DEC's LA120 printer. It also adds the APL character set and facility for programmable characters.

DEC has been wary of supporting foreign equipment in its own kit. AS DEC's Greg Carlow, a field service manager, says, DEC's objective is to provide support for its own equipment. "A secondary objective is to provide support to customers wherever DEC can, on the range of equipment the customer uses."

Such support is normally only provided on a local office basis. Where there is sufficient manpower with the appropriate skills to cover particular equipment it will do so, says Carlow, and it is rare for foreign kit to be supported on a nationwide basis like this.

But with the Datasouth board, as with three or four other products, the number of DEC customers already using the upgrade has made it worthwhile for DEC to offer support nationwide.

Looks static, acts dynamic

AFTER static RAMs and dynamic RAMs comes the integrated RAM. Intel is currently sampling an 8K by eight bit part, the 2186, which it describes as an "integrated" RAM or iRAM – a dynamic RAM that looks like a static RAM from the outside.

Refresh circuitry, needed to maintain the information stored in a dynamic RAM by constantly rewriting the contents of each memory cell so that the information is not lost in the decay of the stored charge, is integrated on-chip, so that to the user the device appears to behave like a static RAM but has the high density and price advantage of dynamic RAM.

The part will go into volume production in the fourth quarter of this year, and will be priced in the $20 range for quantities of 5,000 units.

MICRO BRIEF

BCPL is available on the 6809

SYSTEMS programming language BCPL has been implemented on the Motorola 6809 microprocessor. The M6809-BCPL package from Martin Saxon in London runs in 40 Kbytes of RAM under the Flex operating system. The SWTP ASMO9 assembler is needed to assemble the compiler output.

M6809-BPCL sells for around £150 and is available now. Code for putting into ROM can be produced using the BCPL-Romcode package, which will sell at £20.

Bumper sales

LEADING Japanese microcomputer manufacturer NEC expects to double its home sales in 1982. It already claims to supply 45 per cent of Japan's personal computers, but by the end of the year reckons it will have sold 300,000 of the PC-8000 in Japan alone during 1982.

iAPX prices cut

INTEL has dropped the price of its iAPX 86/20 and 88/20 enhanced data processors by half. They are made up of the 8086 or 8088 microprocessor plus an 8087 numeric co-processor. Volume pricing is projected to drop by half again in 1983. Greater than expected use of the numeric processor in high volume applications like personal computers and graphic displays has reduced unit production costs on the 8087.

Standard proposal

NCR has joined with disc manufacturer Shugart to propose the SASI universal interface introduced last year by Shugart as an industry-wide standard. The proposal made to the American National Standards Institute covers detailed hardware and software specifications to allow mixing of floppies, Winchesters and streaming tapes without affecting CPU operating system or applications software.

8086 for Q-bus

INTEL'S 8086 microprocessor has been brought to DEC Q-bus users by US company North Atlantic Industries. A dual-height single board is compatible with the Q-bus protocol, but has the one-megabyte direct addressing range of the 8086 rather than the 60-Kbyte of the DEC LSI-11/2 or 256K of the 11/23.

Paris subsidiary

THE young UK software company Micro Technology and Sharp of France have spawned a joint-owned subsidiary near Paris. The new company, called Micro Technologie SA, will market Micro Technology's software through Sharp dealers in the French speaking world.

For Apple III

COBOL programming tools Animator and Forms-2 developed by Micro Focus are to be available through Apple for the Apple III microcomputer. Micro Focus' Level II Cobol, which is compatible with mainframe-level Ansi '74 standard Cobol, is also to be offered as Apple III cobol, to run under the SOS operating system.

UK agent signed

SYSTEMS specialist Microsystem Services of High Wycombe has been appointed exclusive UK agent for US company Hi-Level Technology. The Emulyzer from Hi-Level combines a PROM emulator with a logic state analyser to allow system development work on machines with microcode words up to 128 bits wide.

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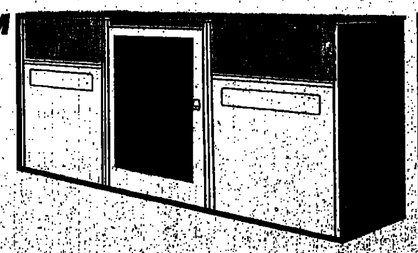

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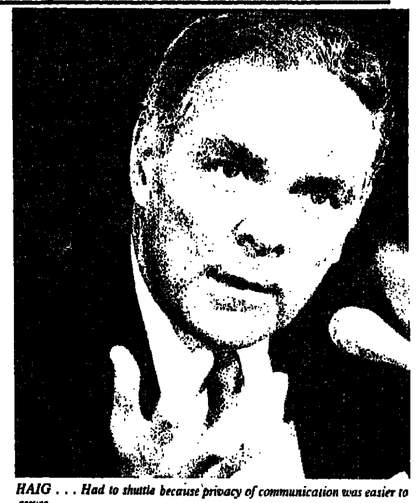
DATA PROTECTION

Opposition to government data protection proposals is gathering pace . . . Sociologist Dr Boris Allan airs his views

IT's a brave new world—but the enthusiasm is unrealistic



HAIG . . . Had to shuttle because privacy of communication was easier to assure.

"New forms of communication, and easier access to information, raise questions about the relationship of government to the governed, the responsibilities of professions to their clients, and the privacy of personal data."

Information Technology *(1.11) HMSO 1980*

"Though conversing face to face, their hearts have a thousand miles between them."

Chinese proverb

INFORMATION Technology (IT) has fired many with a touching enthusiasm – unrealistic, but touching. We are told the world will be a very different place with the inevitable changes which technology will bring.

The brave new world assumes such a change in people and society that most commentators who have queried such an inevitable change have concentrated on aspects such as employment, and are only too easily classed as modern Luddites – though for a great deal of the time one gets the feeling that General Ludd has had a bad Press.

Such changes will not easily occur, because the single-minded advocates ignore far more basic social and interactional aspects which cannot be described as irrational.

British governments of all complexions have stood firm on the need of the State to interfere in the public's private affairs. When in opposition, token worries are expressed about the depredations of the agents of the State (be it Customs and Excise, Inland Revenue, the police, or other more secretive agencies). But as soon as the opposition becomes the government,

> **"MPs could deal with constituents' complaints by TV link from their offices instead of through personal interviews."**

attitudes change. Surely, therefore, the individual's need to protect himself against such depredations in key areas of privacy must be seen to be highly rational.

The 1980 Information Technology report quoted above considered this to be an important question, because as it said, "Power from the use of information, which can now be provided by IT, is great and there is clearly potential for abuse."

The report felt that justifiable fears of such abuse were a major reason why people resisted new ways of collecting and handling data by both government and the private sector.

In April in the Commons the Minister of State concerned with IT, Kenneth Baker, told the House that the new television services proposed in the Cable Systems report (HMSO 1982) would "change the fabric of society". Baker amplified on this familiar statement by saying that doctors soon may conduct surgeries with patients via television.

One must question whether doctors could realistically hold their surgeries by television for complaints of a physical nature – how does a doctor examine a patient through a television screen?

"Press yourself here, and tell me if it hurts"?

Baker has been carried away by his own enthusiasm in the hope of making his own job easier. MPs could deal with constituents' complaints in a similar way, by TV link, from their offices in Westminster instead of through personal interviews.

To deal with one's constituents at arm's length is probably a recipe for losing the next election.

In his book Up the Organisation (1970), Robert Townsend says that conflict within an organisation is, up to a point, a sign of a healthy organisation: "But keep all the conflict eyeball to eyeball," he advises.

By which he means: Do not submerge the conflict in memoranda.

Today we could say "Do not distance the protagonists by use of video channels".

We have had an illustration of the importance of "eyeball to eyeball" contact with the ill-fated Alexander Haig shuttle in his mediation between Argentina and Britain: the US government has available telecommunications facilities which render the shuttle redundant.

It is worth noting that one of the minor scandals of the shuttle was the tapping of a telephone conversation between President Reagan and Haig (telephones are televisions without the pictures).

If this had been a face-to-face meeting, there probably would have been no such intrusion – to overhear a conversation by some telecommunication device is far easier than to overhear a conversation in a room.

Haig had to shuttle partly because the privacy of communication was easier to assure, and partly because people like to be with the other parties to the discussion.

Another aspect of privacy is that of data protection, for which neither of the two main parties of the Seventies can take any credit. One of the recommendations of Information Technology was that "The government should bring forward proposals for data protection legislation without delay."

Recently a White Paper was published on data protection which gave the government's proposals for legislation.

The legislation will not apply to data that need be safeguarded for the purposes of national security – an ill-defined term with worrying precedents. These exemptions will include some data needed by the police and other security agencies but registered data users who make information available to the authorities in such matters will not be required to register these disclosures.

Some of the information revealed might be incorrect (as much of this information is found to be on examination), so what redress has the individual?

Breach of the data requirement principles is to be a civil (as opposed to criminal) offence, and their purpose will be to ensure that data subjects who have suffered damage because of the breach of the requirements governing data use can secure compensation.

"It is not envisaged that the Registrar will have any role to play in relation to civil proceedings, which will be the responsibility of the individual who alleges he has suffered damage."

So, yet again, the State has not taken seriously the right to privacy of the public. In the State sector, complaints about data systems, which allege injustice "caused by maladministration" can be referred to the appropriate Commissioner for Administration (or Ombudsman).

This threat is not likely to cause many public authorities to lose much sleep. The number of local authorities who have ignored the Commissioner's recommendations is growing.

The Court of Appeal on May 6, 1982 confirmed an order which allowed the police to freeze the bank account of an accused person, until that person's trial. This means that if a person fears the law, the one place not to keep the money is in a bank account. In what is supposed to be becoming a cashless society, the safest place to keep one's money – if one fears the police, or the Inland Revenue – is in money. With the great, but unknown, size of the unofficial economy many transactions have to be in cash.

Travellers to the US who go outside the main cities will often find new insights into the famed US cashless society. Many such travellers encounter great difficulty in changing even American travellers cheques in the more rural parts of the country – cash is the normal medium of exchange.

The growth in the US cash economy is such that in the last 20 years the amount of currency in circulation has approximately quadrupled. This quadrupling is the equivalent of an annual rate of inflation in the amount of printed money of about 5%.

If, as the data protection proposals seem to suggest, the Inland Revenue, or Customs and Excise, can obtain information from your bank – by law – without your permission, the implication is clear.

Privacy is very difficult to ensure in a society dependent on communication devices because computerised databanks can intrude on individual freedom far more easily than the individual can on theirs.

In a wired society it is not straining technology too far to suggest that while you are watching them on your console, THEY might well be watching you. Until governments begin to take the problem of privacy seriously and not indulge in an international window dressing, the prospects of a wired society are low.

Kenneth Baker may want to talk to his constituents at long range by television, but a wired society requires the whole-hearted acceptance of a communications terminal in the home paid for by the householder, and needs the question of privacy at the top of its list.

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GILB'S MYTHODOLOGY

Principles of Infotecture–7

It will pay to capture those errors early

Tom Gilb is an independent consultant, lecturer and author on computing topics.

THE Seventh Principle of Infotecture is: It will usually pay off to discover weaknesses in your proposed design techniques at the earliest possible point in time.

Far too much attention is being paid to finding errors in programs during testing phases and by reading "structured" program texts.

As the TRW Software Reliability Study (North-Holland) showed, this late error-finding approach may be economically unsound. The study traced errors which had been corrected by means of program maintenance, in four large systems, to the source of the error. On the average 62% of the maintenance errors had occurred before program coding had taken place.

In other words, there was an opportunity to capture the design error at an earlier point in the development process.

Capturing errors at earlier stages has obvious management advantages – more freedom to select people, time, and tools to correct the situation. But there is also a clear economic and work-power productivity advantage in capturing errors at early stages of development.

Studies carried out by IBM on real and large systems, with corroborating evidence from TRW Systems and General Telephone and Electronics (GTE), shows that the cost of repairing an error in system development specification increases by an order of magnitude for each further stage of development which the error is allowed to slip past.

IBM Santa Teresa Labs reported in 1979 that if program coding errors were not caught until after the testing stage the correction costs were 23 times higher than the corresponding errors which were caught during the one stage earlier code inspections. They also reported that errors which slipped through to the field, but which had originated as a coding error, cost IBM 67 times as much to repair as did the same class of errors which were caught at the code inspection stage.

This, by the way, is a powerful argument for the use of Fagan's Inspection at all possible earlier stages of system description: the error correction costs are far lower.

One of the temporary restrictions which IBM Santa Teresa Labs reported to me on extending the concept of strict quality control (stricter than traditional review techniques – as strict as Fagan's Inspections) to the many higher level forms of design documentation, has been language. The design language used hitherto has been too unclear to allow the kind of objective "proof-reading" comparison which characterises Fagan's Inspection. For this reason IBM has been examining stricter language constructs at the pseudo-code level and within the framework of my Design by Objectives methods (explained in earlier columns) and Software Metrics (Studentlitteratur, Lund).

One striking example was the application of one hour's amateur inspection which compared the project leader's "system attribute specification" using software metrics, with the New York Electricity Company's presidential goals for the project. Twenty-two glaring differences were found at this stage.

It is worth throwing on the fire the consistently recorded facts, which surprise most professionals, that (according to IBM studies and others) conventional program testing is only capable of identifying 30% of the actually existing errors, while Fagan Inspections are capable of identifying a full 80% of the available errors. Combined with the economic benefit (order of magnitude cheaper to repair), the Seventh Principle of Infotecture looks like a big winner.

Tom Gilb

HUMAN TOUCH

One man's debit is another man's credit

Cliff Dilloway is an independent consultant specialising in accounting software, taxation and payroll.

THERE is only one accounting joke. It concerns an aged accountant whose wisdom was renowned and who was often consulted by his colleagues. When consulted he always looked at a faded scrap of paper that he kept in his top left-hand drawer and which obviously contained the source of all his wisdom.

When away from his desk that top left-hand drawer was always kept locked, so when the aged accountant eventually died his colleagues burst the drawer open to obtain access to the source of profound wisdom.

The faded scrap of paper said: "The debits are on the window side".

That this joke should appeal to accountants shows that they, as much as anyone else, have no easy answer to the question of whether an entry is a debit or a credit.

The difficulty is that this question is not phrased properly. Every debit must have a credit. So the question that has to be resolved is where does the debit go and where does the credit go?

My own mnemonic is to remember that cheques come in as debits on the left of the cash book and go out as credits on the right. In other words, work from right to left as with anything else and just remember that debits are on the left.

That rule is satisfactory as far as it goes, but it does not tell you where the other side of the cash transaction has to be posted. The rule establishes whether the other side of an accounting entry is a debit or a credit, but not what account it should be posted to. Which account we must leave to another day, but Figure 1 shows the ledger the entry should be made to. The entries are connected by the letters (A), (B), (C) etc to show the two sides of an entry.

For example, the debit entry of cheques received in the cash book is posted as a credit in the sales ledger.

An example of how one man's debit is another man's credit is between the cash book and the bank statement. Cheques received by a customer are his debits. When paid into the bank they are posted as credits to the banks' customers' accounts and that is how they appear on the bank statement.

Cliff Dilloway

	DEBIT	CREDIT
Sales Ledger Customers' Personal Accounts	Invoices issued (B)	Cheques received (C)
General Ledger	Analysis of Purchases (assets) (A)	Analysis of Sales (and liabilities) (B)
Purchase Ledger Suppliers' Personal Accounts	Cheques paid out (D)	Invoices received (A)
Cash Book	Cheques received (C)	Cheques paid out (D)
Bank Statement as in the books of the bank	Cheques Paid i.e. met	Amounts paid in

Figure 1.

FOCUS

Everyone's getting in on the micro act

THE long-standing guardian of the data processing professional, the IDPM, intends to get more closely involved in microprocessing. For a start, the association is calling for greater compatibility in such matters as standard operating systems, eight to 16-bit upgrading paths and floppy disc equipment.

Surprisingly, the IDPM standard list does not cover the major area of disquiet, that of micro distributors. Micro outlets include manufacturers, distributors, systems houses, high street stores and even mail order. Before long, Exchange & Mart and NME will probably be featuring secondhand micro sales.

A leading authority on micro retailers, Read-Out Publishing, has estimated that there are already over 1,500 micro stores and distributors in the UK – a figure which is escalating daily.

The growth is not unexpected, given the forecast of the London Stock Exchange. Brokers Smith Keen Cutler suggest that the present 30% a year growth in microcomputer sales is opening up major opportunities, which even now is not fully appreciated by the public.

If this is the case, then the public must be highly unobservant with micros on display at the local video rental store, chain chemist, book shop and the local library.

Whether the marketing of micros in such establishments is a correct and healthy operation, however, is open to some doubt and disquiet. Are major book shops, which would presumably hesitate to sell domestic vacuum cleaners or deep freezes, competent to contribute useful micro advice?

In their haste to establish widespread sales outlets, micro manufacturers it seems, have adopted the motto: The More the Merrier. Selection criteria appear to be influenced more by available shelf space than available expertise.

Business user micro awareness levels probably begin when the equipment is being unwrapped and powered-up. Instead of hand-holding, the users find their hands holding an instruction manual and a soldering iron. That many users would be happy to pay a premium price for a premium service is one which has already been acknowledged by Digital Equipment.

A recent US survey has revealed that within the next five years, over half of all office workers will have a personal micro. The challenge for the UK should be picked up by the IT Year organisers. Rather than floating micro trains, vans and race-horses around the countryside in a manner reminiscent of Wells Fargo, the organisers should attempt to establish an IT approved data centre in every major town.

Balancing the displayed range of hardware should be adequate supplies of suitable software and professional advice. Store personnel should be limited to those holding a NCC proficiency test, two years' experience working in a data processing environment or membership of an approved micro club.

Alan Simpson

DOWNTIME

Whatever happened to System 36?

IBM's small business users have been led up the garden path – and left on the fence. These faithful users were told they would find in the garden a machine to plug the gap between the existing System 34 and the more powerful, but incompatible, System 38.

This machine, they were led to believe, would be called System 36.

"IBM is being obnoxiously coy about the machine," said a large-scale multi-national user of System 34s. "We were led to believe that it would be announced in the first quarter of 1982 but this was deferred to the second quarter because of IBM reorganisation."

Well, the second quarter has been and gone, and where is System 36? Nowhere to be found.

So what sort of reorganisation is this?

Anyway IBM, which prides itself on never talking about anything yet to come on the market, has declined to confirm or deny the machine's existence.

Still, there is some consolation for deserted users of the System 34. Beyond the garden fence lies a healthy young orchard of Japanese plug compatibles. Just give them a year, and they will bear fruit.

Anti-British actions

IT seems that computer users in the British public sector will not be allowed to make up their own minds about which computer to buy when US-owned companies are in the running.

No fewer than three actions are either planned or current against public sector organisations for choosing a British-made mainframe of distinctly orange origins in orders where the Americans thought they should have the contract.

In one instance IBM is suing, and Sperry Univac is reported to be planning to sue the Severn Trent Water Authority, so presumably Sperry will wait on the outcome of the first action to decide on its own course. Burroughs has its own plans to sue Oxfordshire Regional Health Authority.

The serious side to this business is that of preferential procurement. This is outlawed by the EEC, and that, presumably is why the actions are being brought. However, the English High Court hardly seems to be the place to bring this kind of case.

On the other hand, the systems in question would probably be up for their next renewal before the EEC sorted out the mess. And given the recent performance of some of the claimants, that might be a mite too far into the future for comfort.

White world

THERE is no truth in the rumour that IBM is setting up a sideline in white shirts.

It all began when IBM said it could not provide enough staff to support all its systems in the US. Why? Because there were not sufficient white shirts to go round.

In the US, IBM insists that staff wear white. And come the summer, when sticky necks and smelly armpits dictate that white shirts be frequently changed, shops run out of them.

Especially when all the employees of an organisation the size of IBM wear them.

The test-tube computer

MY Dad once told a gullible son that we would all be either computer programmers or molecular biologists by the year 2000. I still think he was right.

But how right he was is only just beginning to emerge. For the question is now being asked: When will we have the first test-tube computer?

A molecule that can exist in two states to represent a computer bit of information has already been synathesised in the States. An attempt is being made at Mississippi University to make a molecular diode, to allow current to pass in one direction, but not the other.

One K of such molecular components will, would you believe, fit into a line a micron long!

The romance of words

"A PROPOSED revision to American National Standard X4.13-1971 has been drafted by X3 Technical Committee X3B10, Credit/ID Cards."

Now what the world is this? I shall enlighten you. It is the first sentence of a Press release telling us that the American National Standards Institute (Ansi) proposes to change the format of financial transaction cards. There is no indication what financial transaction cards are being talked about, or why anyone should want to change them.

And does it not strike you what marvellous lyrical names these divisions of Ansi all have? There is X3J3, the Fortran committee, X3J4 the Cobol Committee, and now X3B10, the Technical Committee proposing a change to Standard X4.13-1971.

What a dangerous job we have here at Computer Weekly, treading gingerly through minefields of acronym, abbreviation, tautology and cliché. I think we do rather well to deliver such a readable paper after all that.

Chad

10 YEARS AGO

From Computer Weekly of July 13, 1972

THE Department of Trade and Industry issued statistics on the UK computer market showing that in the first quarter of 1972 output was at its lowest level for more than two years, deliveries of hardware were similarly depressed and exports were at their lowest since the second quarter of 1969 . . . A further step towards the computerisation of firearms was taken with the publication of LAMSAC's second report on the subject, which recommended the use of a standard code for specific items common to firearms registration . . . IBM UK announced a new terminal, the 3780, to supplement the existing 2780 . . . A rise in the level of support for computing science research projects from £500,000 in 1971-72 to £2 million by 1975-76 was the major recommendation by the Computing Science Committee of the Science Research Council . . . in a deal which was unusual if only because it involved a UK computer company taking over a US competitor, Standard and Chartered Leasing Company acquired, for £1.7 million, the UK computer leasing and broking interests of Boothe Computer Corp, to trade under name of S. & C. Leasing.

ComputerWeekly

Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS

Thursday, July 15, 1982

BTG asked to defy gravity

THE problem with the British Technology Group, is not the BTG itself, but the government and the objectives it sets for the organisation. The objectives are reminiscent of nothing so much as the Pushmepullu, that ridiculous animal in the Dr Doolittle films.

The BTG is required to make a rate of return on investment of 13.07%, something the bluest of blue-chip companies find all but impossible.

At the same time it is required to invest in projects that, to put it simply, blue-chip commercial operations would not touch with a barge pole. As if that weren't enough, the group is required to treat its investments as losses in the year in which they are made, but to use the following obtuse formula to calculate the profit in the year in which the investments are realised:

$$\Sigma R + C$$
$$\Sigma C \text{ (Ir/Ic)}$$

Hardly surprising, then, that many of the BTG's senior staff have trouble understanding their own accounts, much less some of the unfortunates required to report these accounts to the public.

Even BTG chairman Sir Frederick Wood put the loss at £56 million for last year, when in fact the group lost £44.4 million.

The first figure comes from what amounts to a subsidiary account, the latter from the consolidated or final accounts of the organisation.

This sort of confusion makes it easy to see why the grossed up start-up costs of the United Peripheral operation in Winsford, £32 million, were overlooked.

But a costly project like that is surely a major computer industry event.

Why have we and the world heard so little about UPL?

And while we are on about it, how can a public body calmly lose £34 million on an operation like Nexos, the equivalent of creating 1,360 jobs at £25,000 each, without anyone calling for some form of inquiry?

On the basis that any attempt to lay blame is futile, do not those who paid the piper – the public – at least deserve to know what lessons have been learned?

This is not to say or imply that the BTG should not make losses, simply that its operations should be far more open to the public who pay for them.

Most of the group's problems stem from the fact that the government is trying to make the organisation defy financial gravity by making a high return on capital in investments that commercial organisation will not touch.

Funding for starters

LESS than a year ago this paper launched the first computer industry financing conference in the UK. Run in conjunction with the merchant bank Singer and Friedlander, it gave entrepreneurs in the industry an opportunity to meet financiers face to face. And last month Computer Weekly and Barclays Bank sponsored another financing conference.

The object of both conferences was to strengthen the links between people and institutions with money to lend, and computer industry companies needing funds. It was hoped that a measure of change might be effected in what was generally reckoned an unsatisfactory situation in relation to the early funding of young companies in the UK computer industry.

If the momentum for change which began at the two national conferences is to be sustained, it is essential that meetings such as those organised by Heseltine Moss last week in Reading (see page 9) should take place around the country.

Getting UK funds behind UK computer companies has wide implications and employment is one of the most important.

1984 and all that . . .

THIS week's example of the strange things people say about computers was sent in by Graeme Hewson of Uxbridge, Middlesex, who wins £5.

The transputer is the brainchild of Inmos director, Iann Barron. It is a microchip consisting of a small central processing unit and a memory storage unit. The advantage is that it can be connected to other chips performing other functions. However it will not be in production until 1984 at the earliest.

Sunday Times

LETTERS

Some points on Codasyl database

A FEW important points need to be made about the article by Martin Hammer on a Distributed Codasyl Database (CW, June 17) since there are alternative approaches which need to be publicised.

Firstly, Hammer's article appears to imply that a single schema exists although it is unclear whether an identified copy should exist at each node. There are many cases of distributed database systems where there is the requirement for a number of different schemas. This is to take account of different functions occurring at different nodes.

The most general way to look at distribution is in fact as a system of co-operating databases each with its own schema and with the need for a management co-ordination function which could be centralised or federal in nature depending on the environment.

Secondly, Hammer has not applied his ideas to the latest Codasyl specifications which separate storage information from the schema. Several products (ie ICL/IDMS and DEC VAX-11 DBMS) now incorporate such a separation. Following Hammer's approach all extensions could be made to the storage schema. However, this confuses local control of efficiency with geographic storage distribution, the latter involving considerations other than efficiency.

In practice there is a strong case for an architecture which allows a special geographic schema to handle distribution effects separate from both the schema and the storage schema at each node.

Thirdly, there is no need for modifications to the DML to handle distribution. A geographic schema could contain details of distribution in terms of application data item values and current DML could be utilised in like terms. For example, rather than storing a record, say a customer account record, at a particular node, which would correspond to a bank branch, it would just be necessary to identify the bank branch, for example by a data item value in an explicit bank branch record and then the geographic schema would determine the actual node for storage.

These points are based on work in progress of the BCS/Codasyl DDLC Data Base Administration Working Group (DBAWG). The current state of affairs is that a schematic architecture is close to finalisation and work is shortly expected to begin on syntax which it is hoped will eventually be considered formally by Codasyl.

A paper on this architecture is being presented at the British National Conference on Databases in July.

Dr G. M. STACEY
Chairman, DBWAG
Edinburgh Regional Computing Centre.

LANs have their place in the office

I FEEL I must take issue with the closing remarks made about Local Area networks (LANs) in David Henson's article (Forget the "Paperless Office", It Just Isn't Going To Happen – CW, June 24).

In an otherwise inoffensive piece, he answers some well-worn statements with acknowledged good points, but alas, he concludes by dismissing it, like a spoilt child dismissing the game of marbles as "no good", because he hasn't got any.

Yes, just like any technical innovation, some LANs have their problems, but to suggest that they are responsible for giving office automation a bad name is taking things too far!

Necessity, they say, is the mother of invention, and in the harsh business world executives seeking increased productivity and economy have been forced to move their battlefield from traditional factory and administrative data processing functions to the office environment. As a result they have exposed the financial and operational weaknesses of conventional "one-box" technology.

The simple fact is that, when all is considered, the concept of the LAN is that bit closer to the theory of information processing systems, and while in some cases it is worthwhile bucking the laws of nature to make progress, why do it when you don't have to?

This is not to argue that LANs are the office automation panacea but merely to point out that like the mainframe computer, the minicomputer, the shared logic computer and the micro, LANs have their place and, if anything, are making office automation more acceptable.

Datapoint is accredited with being the world's leader in LANs, having over 4,000 installed worldwide, 120 in the UK, but there are many other successful suppliers that bear witness to the useful contribution the LAN makes.

Go on, admit it! – marbles can be a rattling good game for all the family!

DAVID FAVRE
Marketing Consultant
Datapoint (UK) Ltd
London NW10.

Great oaks from little Acorns

WE are a children's playground in central London and during the six weeks of the summer holidays we can have as many as 300-400 children during the daytime taking part in our summer holiday project.

Sporting and craft activities are reasonably well covered but there is a zero input of mind-stretching technology because quite simply we don't have any equipment.

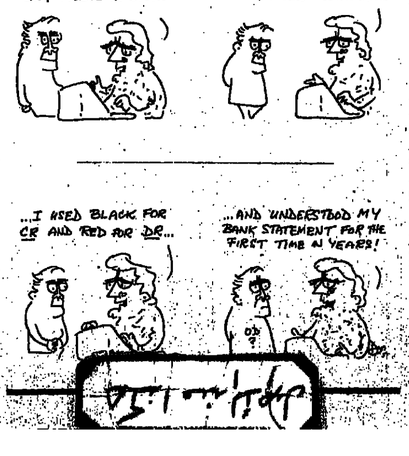
Is there anybody out there who has an Acorn or an Apple (or a Cray 1!) or something similar who would be willing to lend it to us for six weeks so we could run computer experience sessions?

I should emphasise that we do have access to experienced computer personnel who are willing to run the sessions; we do have a secure room in which to keep the equipment; and of course we would accept full responsibility for it.

Our summer programme starts on Monday, July 26, and finishes on Friday, September 3. It is aimed at local children of the area and we do not charge for activities if at all possible.

HELEN HAYS
Administrator
Coram's Fields and the Harmsworth Memorial Playground,
93 Guilford Street,
London WC1N 1DN.

Liveware File by Don



Mapse, Apse and Kapse

IN the article on the government's call for a software initiative (CW, June 24), you state: "A little confusion, to say the least, is caused by the terms MAPSE and APSE"!

I would hate to add to this confusion by mentioning KAPSE (Kernel APSE) but would like to point out that, in all the designs I have seen, the database manager is included in the mapse.

However, I would like to suggest that, although "Absolute Programming Systems Environment" is a rather neat expansion of APSE, the US Department of Defence, among others, favours the rather unimaginative meaning Ada Programming Support Environment.

Please do not feel that I dislike your interpretation but it may lead to a proliferation of new acronyms like NAPSE (Nearly Absolute . . .) or VAPSE (Virtually Absolute . . .).

A. C. HUGHES
Software Research & Development Group
GEC Research Labs
Marconi Research Centre
Chelmsford, Essex.

IBM denial

CONTRARY to the statement in your editorial (CW, May 27), IBM has not joined the Japanese Fifth Generation project.

M. D. STOTT
External Communications Manager
IBM
Portsmouth.

The Editor welcomes letters commenting on subjects published in Computer Weekly, or on original topics. All letters must be accompanied by the writer's name and address, not necessarily for publication. Letters may be cut.

Duplicated mail

I AM surprised to read (CW, June 24) that both you and a reader, Boris Allan, of Stockport, think it amusing, surprising or remarkable that any organisation should say: "If you receive more than one envelope . . . hand sorting is more expensive than postage."

He has received £5 for reporting it as a "strange saying"! If you have not received these words with your mail before now you aren't on the same sort of mailing lists that I'm on.

At the risk of stating the obvious: many charities for example have a list of people who have donated in the past and a list of people who have bought Christmas cards. They send out appeals to both lists.

Many firms, similarly have two lists of potential customers, compiled from different sources. It really is cheaper to send some people two communications than cross-reference the lists and remove duplications. It *would* have to be done by hand.

Have you ever thought what an irregular format a name and address file has? It's quite fun to sort one. The computer could only identify exact duplicates, and not recognise us being the same:

Mr Boris Allan, 13 Acacia Street, Stockport.
Mr B. Allan, 13 Acacia Street, Stockport.
Mr. B Allan, 13 Acacia Street, Stockport.
Mr B Allan, 13 Acacia Street, Stockport, Cheshire.
Mr B Allan, 13 Acacia St., Stockport.

To say nothing of

Mr B Allen, 13 Acacia Street, Stockport, which I guess he's been addressed as before now.

I get my name misspelt on at least 25% of casual mail. Don't blame my bad handwriting – it's printed in block capitals at the top of my headed notepaper.

(By the way, if any reader wants to write to Mr Allan I made up the 13 Acacia Street – full address was not given.)

Obviously neither the Editor nor Mr Allan has worked with an organisation that was mailing to large numbers of people on more than one list, or they would know for sure that it *does* cost more to remove duplication.

The only public relations opportunity the Dutch publisher missed was to say: "If we have sent you more than one of these brochures we apologise for any irritation caused and ask you to pass the duplicate/s on to a friend."

JEAN M. K. DUFTY
Sale, Cheshire.

Elegant system

I WISH to correct a possible misunderstanding conveyed in Boris Sedacca's interesting article on Compec North (CW, July 1).

At Delta Data Systems we commend the CP/M based Wordstar word processing package to users of our Delta 2000 series of intelligent workstations. Wordstar is available for a wide variety of CP/M based microcomputers, many of which have only basic keyboard facilities. Thus operator selected control functions normally require multiple key strokes. To streamline the use of Wordstar, many of these are now implemented through a single key depression on the Delta 2000 series.

Our opinion of Wordstar is that of an extremely elegant word processing facility which provides useful benefits to users of the Delta 2000 series of intelligent workstations, particularly when in Burroughs, DEC, IBM or ICL networks.

C. G. HANMORE
Marketing Services Executive
Delta Data Systems
Welwyn Garden City
Herts.

OP SPOT

The decision to raise standards usually affects only new projects, says Brian Pugh. The logic is fallacious ...

Ops managers need to practise critical analysis

KIPLING defined the basic elements of learning as "six honest serving men" – What, Why and Who, Where, When and How. They are tools which, when put to work in areas of which we have knowledge already, form the basis of improvement.

The technique is known as critical analysis, and is something that operations managers should practise regularly.

Critical analysis is used extensively in organisation and methods studies when, during the course of an investigation, every activity and every aspect of that activity is questioned as to meaning and method.

Anything considered inessential is eliminated to prevent its incorporation into the redesigned system or restructured organisation. In engineering the technique is known as value analysis.

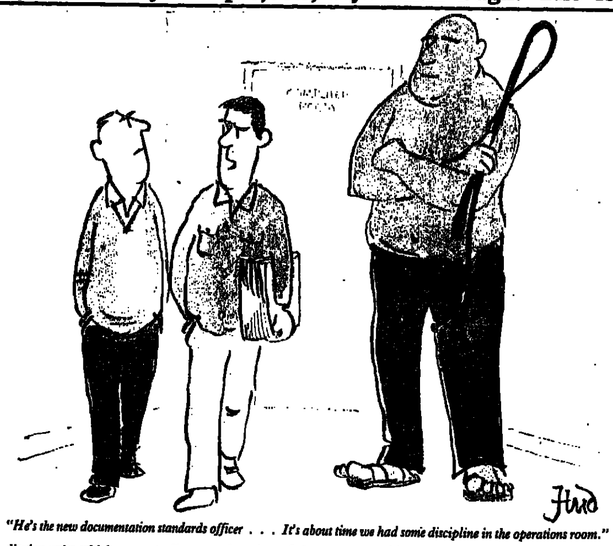
Because many systems analysts came up through the ranks of programming, they have never learned this important discipline. As a result some systems not only are badly designed from an operations point of view, but do not do justice to the requirements of the user, nor do they enhance the status of data processing within the business.

Recently I encountered a new sales ledger system that had been designed in-house to replace one that had been running for 12 years or more. The old one was a brought-forward balance system run in batch mode.

The first management requirement was for an open item ledger which would produce an ageing debt report. If the data processing department had had a higher credibility rating this could have been challenged. The nature of the business was "cash with next order", and because the majority of customers submitted weekly or fortnightly orders, that should have been the extent of their credit.

However, the control of credit had got out of hand, through no fault of the accountants, and the problem was compounded by a few large and unprofitable customers who became notoriously slow payers. Management, instead of tackling the problem, decided to build a system around it.

The second requirement, at the instigation of the DP department, was that cash reconciliation should be interactive. There appeared to be some initial justification for this because it would make the user's job easier. But things went disastrously wrong in the early life of the system, and totally destroyed the user's confidence in it for a period of time. There was also an additional cost of providing visual display units which was not offset by savings elsewhere.



"He's the new documentation standards officer . . . It's about time we had some discipline in the operations room."

But it was in the overnight batch run following the daily transaction processing that poor system design was highlighted in a dramatic fashion. The batch run was necessary to post invoice records, generated in batch mode, to the ledger. The new batch system took three times as long to process as the old one.

Because operations were not involved in any way in the design and testing of the programs, this ludicrous state of affairs did not become apparent until the first production run. If operations had been included in the role of operations analyst, and if critical analysis techniques had been applied, there is the chance that the eventual system design would have been of a better quality.

As it turned out the user was outraged when he saw both his increased costs and the havoc caused to established schedules by the additional processing time.

A blitz on the system resulted. Coding and in some cases whole programs not considered absolutely essential were jettisoned in order to reduce the overall run time to a more acceptable level.

Lessons can be learned from this example. The quality of systems design, as well as their operability, must be raised so that the credibility of DP becomes high enough to constructively challenge corporate management assumptions. The quality of the operation can be raised by constantly subjecting all aspects of it to critical analysis.

The subject of operations involvement in new systems design has already been dealt with in these columns. While this is essential for the future working of the department, improvement to existing systems must not be overlooked.

It is unfortunate that whenever a decision is taken to raise standards, it is only applied to new projects. The sheer volume of existing jobs precludes retrospective action in the minds of most managers.

The logic of this is fallacious. If a job has been in existence for the past few years and it is to continue running for the foreseeable future, then a re-examination of its function will pay dividends.

Those six honest serving men could be the most productive members of your staff. Apply them to every aspect of the operation and then challenge the answers to see if they are valid.

- What is the purpose of a particular program, and is the purpose achieved to the user's satisfaction?
- Why is the purpose considered necessary, and is it still relevant to the needs of the business? If there is output does the recipient use it? What would happen if the program was run less frequently or not at all?
- Who prepares the input, and can it be supplied more efficiently from another source? If it is keyed in can it be obtained from an existing file? Can the data capture method be improved? Who receives the output – should the number of copies be increased or reduced?
- Where is the program run, on a central machine or a remote one? Is it run on one CPU or on several? Will the alternatives prove more beneficial? Should batch validation programs be run at the point of input or the point of processing?
- When is it run, and can it be run more effectively at a different time or in a different sequence in the schedule? Should sequences be run at the start or end of a day or immediately prior to update? Must the program be run at a specific time or can it be moved to an off-peak period?
- How is the program initiated, by central or remote operator, by a user or another program? Is there a better way of initiating it?

This form of questioning can be applied equally to individual programs, suites of programs, tasks performed by each member of the staff or to hardware.

In seeking the answers never accept one containing the word "because". This word is always used to explain why something cannot be done. The results of a critical analysis should always outline the expected effects of all the alterative courses of action. Then decisions can be made on the basis of which effect is most desirable.

The action necessary to pursue a desired objective may not always lie within the capability of the operations department. Requests for resources may be required of the systems and programming personnel, of engineers and sometimes of users.

But the operations manager and his team are the only people who can take the initiative in this kind of investigation. Systems departments are too preoccupied with new projects to worry about existing ones unless something is radically wrong. The user is too timid or inexperienced to examine the workings of his system.

The operations manager must embark upon such a programme to combat deficiencies in the original design, to eliminate the unnecessary expenditure of resources and to ensure his staff are most profitably utilised. A re-appraisal of this kind would start slowly reviewing one thing at a time, gathering momentum with experience. The order in which items were reviewed would be determined by the composition of the workload.

It is only by consistently subjecting the mechanics of the operation to a constant re-assessment that efficiency can be maintained at peak level.

Did you know...?

- no consensus has yet been reached on who in the organisation should be responsible for office automation
- distributed processing is increasingly transferring computer power from central control into the hands of users
- the 'management information control centre' and the 'corporate information utility' will become key components of commercial organisations
- proliferation of 'professional' personal microcomputers will call for installation and engineering self-support

Did you know...?

- the next five years will present numerous opportunities for strong, informed and able management to establish Computer Operations as an essential and irreplaceable element of management services.

Did you know...?

- Pergamon Infotech has designed a special conference for Operations Management to establish 'The Future for Computer Operations' to be held in London on 1-3 November, and by returning the coupon or 'phoning Maidenhead (0628) 39101 you can get full details.

I need to know more about the Future for Computer Operations

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COURSES

■ AN introductory course on Prolog is being offered by Expert Systems who describe it as "a Fifth Generation language". The one-day course will be held on July 29, August 12 and September 7. Details phone 0865 42206, or write to Expert Systems Ltd, 31 Alexandra Road, Oxford OX2 0DB.

■ COURSES offered by Cisi to the end of September, include Wordstar word processing, 29-30, September 9-10; CP/M user, July 26-27, August 23-24, September 27-28; Basic programming, September 20-24; Advanced Basic, September 13-15; and Introduction to computers, September 6. Further information can be had from the Cosine Secretary, Computer Training and Education Centre Ltd, 2nd Floor, 107-109 Clerkenwell Road, London EC1M 5SA. Tel: 01-251 4010/4019.

■ MANAGING Sales Through Distributors is the title of a training programme available from the Tratec division of McGraw-Hill International Training Systems UK. It is aimed to help sales managers of large manufacturing companies to communicate effectively with their distributors. Details from Jonathan Shead, Sales Manager, Tratec Division, McGraw-Hill International Training Systems UK Ltd, 99 Sheen Lane, London SW14 8AZ. Tel: 01-876 4040.

PROGRAMMERS PAGE **by Philip Hunter**

The man with a dedicated approach to expert systems

HAWKINS . . . Nervous about machines coming to a conclusion.

ANYONE who is anyone in expert systems was at last week's Fifth Generation Conference in London. A notable exception was David Hawkins, who set up the UK's first dedicated expert systems division at Racal Decca.

Hawkins knows exactly what he wants to do and feels no need to indulge in the kind of abstract debate that ran riot at the Fifth Generation Conference. His desire is to apply today's technology tomorrow rather than tomorrow's technology today.

Hawkins arrived home last autumn after 15 years abroad working in the oil industry with the French company Schlumberger. This experience will at first be directly invested in developing expert systems for oil exploration and well digging. Later Hawkins hopes to spread into other applications of machine intelligence such as medicine.

He sees two fundamental problems in building effective expert systems: obtaining the information from the expert, and building a workable model for computer analysis.

His answer to the problem is in the structure of the project teams, which in Racal's case will consist of three people. Two computer scientists will be recruited to build the models, and what he calls a domain specialist will be recruited from the oil industry to provide a direct link with expertise on the field.

The computer scientists will, Hawkins hopes, have some knowledge of expert systems. They will possibly be recruited from the universities where some of the pioneering work was done.

The end product will be highly customised systems. Hawkins has no intention of building expert systems generators of the kind sold by SPL and Isis Systems. These are rule-based systems with an inference engine to draw conclusions from a knowledge base.

In a rule-based system the user builds his own models in a dialogue with the system to establish rules on which the so-called expert's judgment is based.

"I'm not dismissive about rule-based expert systems," says Hawkins. However he thinks that they fail to dig deeply enough into the expert's store of knowledge.

Experts use implicit communication, he says. "The biggest problem is getting the expert to make specific statements of how he solves problems. In the real world, experts are much more sophisticated than the way in which they describe the problem."

Hawkins believes that expert systems built from generators merely parody the way problems are solved in the harsh real world. But he only has experience of the oil industry, which is bedevilled by multifactorial problems often described by uncertain data.

And a system built by Hawkins would run into four or five sterling figures, while Isis, for example, has cut the price of its Microexpert to £380.

Clearly Microexpert will appeal to many companies which do not trust expert systems sufficiently to lay out a large investment, and which want to splash around in the shallows before taking their feet off the bottom.

It also has to be said that the extravagant claims made for expert systems by one or two of the pioneers – whose blushes I shall spare here – have given them a bad name. There is no expert system alive that is any more than an analytical aid.

Hawkins admits this. "I'm very nervous about machines coming to a conclusion," he says.

Most experts think and talk among themselves in a language of jargon, acronym and abbreviation. They want an expert system to speak their tongue, and this is another reason for Hawkins' faith in the tailored approach.

Each field of expertise speaks its own jargon language, and within each field there are innumerable dialects. This is a particular problem in the oilfield exploration business, which suffers from a shortage of experts and a plethora of information.

Data on rock thickness, density, permeability, speed of sound in rock and resistance to bombardment by neutrons has to be linked with existing knowledge of the geology and geography of the area to make hasty decisions, often arbitrary and sometimes wrong.

The knowledge explosion has forced people to overspecialise in order to keep abreast of the facts. The trouble is the more specialised you become, the harder you are to understand. Here, Hawkins believes, enters the expert system, which should under-specialise and co-ordinate all the divergent strands of information.

High-level thoughts on the ideal system

PROGRAM portability is a relative concept. It is impossible to escape completely the idiosyncrasies of individual machines and a system of any size will have some machine dependent components. These have to be rewritten when the system is transferred between incompatible hardware.

This is especially true of the most recent recruit to portability – Unix, the popular operating system now available on several small computers.

In principle all operating systems work in the same way, and there is no reason why they cannot be written in a high level language for portability. But at some stage the operating system has to talk to peripheral drivers and memory management. Then the murky depths of machine code have to be faced.

The bulk of the Unix operating system is written in the language C, for which several machines now have a compiler. Unix is divided into three sections of varying machine independence.

Apart from a few memory management bits, the main section is completely machine independent.

There is a largely machine dependent portion, written in C, for driving the various peripheral devices. It is, however, machine independent in principle, with just the details varying.

At the lowest language level are the machine independent assembly language routines to handle allocation of processing time, and mapping of memory.

One of the most powerful portable operating systems is Muss, developed at Manchester University. Muss, like most portable operating systems, is written in a high level language for which a portable compiler is available.

When Muss is carried over to a new machine, a process known as a half-bootstrap is employed. Assembly code for the target machine is developed on the host to facilitate an easy transfer.

Muss, Unix and other attempts at portable operating systems suffer from the need to have machine dependent portions to control the heart of the computer. Thought has been given to an ideal computer, which would have standard "hardware sockets" into which an operating system could be plugged.

All the machine dependent software would then be removed from the operating system, which could use standard commands to address the various peripherals.

Barely bearable bears

ALWAYS on the lookout for novel applications of programming expertise, I can tell you of a system used for monitoring movement of marauding bears in Canada's Banff National Park. The idea is to predict where bears are likely to be found from a knowledge of their colour, behaviour and previous movements.

This may sound a little vague, but the park's authorities have been driven to desperation since 1980, when one man died in the park, and another sued the park for $500,000 after having his jaw torn off by a bear.

The computer system will be used to develop better bear management techniques. One possibility being mooted is to place strategic carrots about the countryside to control bear movements. More realistically, bears could be herded up and dropped in areas in which they are more likely to settle for some time.

I wonder how Winnie-the-Pooh would react to having his movements monitored by computer.

Enigma of the Ada compiler

THE exact stage of development of the Ada language is hard to define.

On the one hand we have members of the UK Ada consortium, and indeed of other consortia, saying that a full implementation of the Ada compiler is still several years off. On the other hand we have a flood of working Ada compilers pouring from the US.

Let me shed some light on this mystery.

An acquaintance of mine recently visited the US and met a home computer enthusiast who had no fewer than six working Ada compilers, bought for between £25 and £50 each.

Or so-called Ada compilers. One of them turned out to be no more than Pascal with Ada keywords, another was RTL/O, a loose research language. The others were similarly cons of one sort or another.

"Real Ada compilers," my acquaintance tells me, "are very difficult to write."

Masquerading as lamb hunts many a wily fox.

PUZZLER

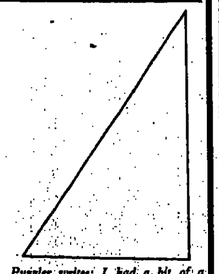
IN this dissection problem, you are asked to divide a right-triangle into seven smaller "scute" triangles (each one having all its angles less than 90°). See page 47 for solution.

Impossible!

DEAR PUZZLER,

Thank you for your interesting spot each week. But I must take you to task (CW, June 24) since the solution to the question as asked is, "It's impossible!" The area 61 × 69 is 4209 square units, a figure which tallies with 2^{12} – 3^6, but not of course with 4,485. It's nice to know that you are human.

HUGH SPARROW
Leytonstone, London E11.



Puzzler writes: I had a bit of a brainstorm with the June 24 Puzzler, and somehow managed to "arrive" at 4485. Thank mangling 61 × 69. Apologies.

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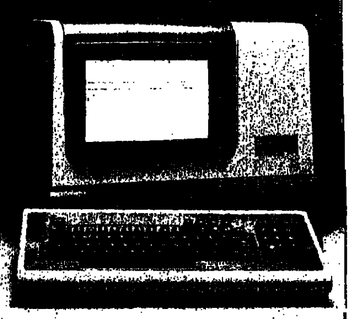

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PEOPLE

SPL gets second managing director

RESPONSIBILITIES of the group managing director of SPL are to be shared between Peter Adams, who currently holds the title and David Thomson, who will join the board of Systems Programming Holdings (SPH) as joint managing director of SPH and SPL in September.

Thomson is currently director of electronic and information technology operations at the British Technology Group and was finance director of NRDC and chairman of its CAD/CAM subsidiaries until the merger with the NEB to form the British Technology Group.

He joined NRDC five years ago and has had a working relationship with SPH throughout the past year, attending its board as BTG representative.

Thomson will take responsibility for finance and commercial activities in the UK and for overseas acquisitions.

Adams, as the other managing director of SPH and SPL and chairman of SPL, will concentrate on marketing and the group's overseas operations.

Aim sets up new division

AUTOMATIC Information Management (Aim) has established a general business systems division to handle sales of all the computer systems not specifically orientated to its two vertical marketing divisions: legal systems and medical systems. It will sell systems based on DEC equipment, hand-held terminals and all non-legal and non-medical microcomputer systems.

Left to right in our picture are Paul Tutton, who has been appointed general manager of the new division from his previous post as manager of the microcomputer division; John Davis, formerly in charge of the retail and finance division and now director of the new division; and Steve Wilkinson who becomes sales manager. He joins Aim from ICL.

■ Terry Dunn has been appointed Northern regional manager for MSI's Warrington office. He was previously with Harland Data Systems as UK sales executive.

■ Professor Brian Randell, professor of computing science at the Science and Engineering Research Council, has been awarded a grant of about £9,000 to join the University of Newcastle-upon-Tyne's computing laboratory as a Visiting Fellow.

■ John Kinnear and Tony Brewer have been appointed to the board of management consultancy Butler & Cox. Kinnear is a founder-member of the company, which was established in 1977. Brewer joined the company later in 1977, and in 1980 was made a partner.

■ Elvin Rose has been appointed director of manufacturing at Able Computer in Irvine, California. He formerly held senior management positions with IBM.

■ Peter Dodds has been named sales director at Tandata. He was previously marketing services manager at Redifon Computers.

■ Brian Smith has been appointed systems director at Sharp Bennett Associates. He was previously distribution consultant with the company, developing bespoke systems for clients.

■ Francis Lorentz has been appointed general manager at CII-Honeywell Bull. He has been deputy general manager at Société Lyonnaise des Eaux since 1980. Between July last year and February this year, he acted as government delegate to the Thomson Group.

■ Graham Lockie has joined System Industries as sales executive for the Greater London, Kent and Sussex areas. He was formerly a regional sales manager with Vermont.

■ Geoff Leary has been appointed reseller business manager at Prime Computer. He will be responsible for business in the North and Midlands, based at the company's Milton Keynes office. He has been with the company for two years as sales executive in the Birmingham branch.

■ Colin Hendry and Paul Ransom, both formerly with Northern Star, have joined Swiss Reinsurance as database administrator and senior systems programmer respectively.

■ Mike Dixon, previously sales director for United Computing, has been appointed sales and marketing manager at Data Logic. Darryl Bowles, previously European sales and marketing manager for Computer Resources, has become area manager. Tony Baker, formerly Restart product manager for Computer Resources has been named product sales manager. Tony Russell, previously with Hoskyns, becomes data centre manager and Xenia Gillian has been appointed sales administrator. All these appointments were made to Data Logic's information systems division. Joining the software products group of Data Logic are Larry Cucchi, as sales manager, from Informatics UK, and Harry Richardson also from Informatics, who becomes support manager.

■ Mary York has left Computer Plan, where she was an analyst/programmer to become account executive for the finance district of ADP Network Services.

■ Cyril Carswell has been appointed to the newly-created position of sales and marketing manager at GCS Engineering. He was formerly a regional sales manager for GCS hardware, responsible for major customer accounts. He joined the company in 1978.

■ David Williams, previously financial accountant with Philip Morris, has joined X-Data as manager of finance and administration and company secretary. He is a member of the Institute of Chartered Accountants.

■ Charles Brett has joined BIS Applied Systems as a consultant in the office automation division.

■ Derek Butterworth, formerly a project manager at NCR's European support centre, has joined software house Harrison Computer Services as a senior consultant.

■ Tony Green has been appointed branch manager for the Northern region at Rediffusion. He joined the company in 1977 as a territory manager and later became area sales manager for the Northwest of England. Dick Morley has joined the company as a sales consultant for the government sector.

■ Dallas Talley has been appointed president and chief executive officer at MDS Quantel, and has been elected senior vice-president of Mohawk Data Sciences. In 1975 as a consultant he established Quantel's international distributor network. He joined the company as senior vice-president in 1980 and became executive vice-president and chief officer two years later.

■ Barry Fuller has joined MSA as a systems consultant. He was previously a systems manager for Coventry Climax.

■ Carl Neun, formerly vice-president of finance at Shugart, has been appointed vice-president for manufacturing-related processes of all eight and 5.25 inch floppy disc drives. Thomas Gardner becomes vice-president and general manager of rigid disc division. He previously held a similar post with Memorex. Gerald Klin, previously with BASF, is the new product manager for Winchester disc drives.

■ Len Corsthwaite, managing director of ASEA Ltd since 1981, has been appointed to a new position in the ASEA Group, with responsibility for creating business opportunities in the oil and gas industry. He remains on the company board. Eric Drewery, who has been managing director of the rotating machinery division of Mather and Platt since 1979, becomes managing director of ASEA Ltd and chairman of ASEA Service.

■ Stephen Fishman has been appointed manager, word processing resources, at the Alfred Marks Group. He joined the group as group technical consultant a year ago.

■ Paul Stirling has joined Arbat as project manager responsible for the implementation of the Swift package in the UK and Europe. He was formerly with Filetab Support Services.

■ David Wilkinson has joined Babbage as sales director. He was formerly with the VLI Group where he set up the company's sales and marketing arm.

DIARY

JULY 20

Information systems in health care. BCS Medical Group, Primary Care Group and Sussex Microcomputer Society. Details Dr Geoff Dove, 01-385 7776.

JULY 23

APL in education. UK APL User Group. Read Lecture Theatre, Imperial College of Science and Technology, South Kensington, London. 2.00. Details P. Goacher (03727) 21282.

JULY 26-28

Electronic image processing — international conference. IEE. University of York. Details IEE, 01-240 1871.

CONFERENCE

■ A CONFERENCE on CAD-CAM is being held next June in Cambridge. Organised by the Computer in Manufacture Committee of the Institution Manufacturing Industries Division, it is co-sponsored by the Institution of Production Engineers. The conference is being held in association with the Cambridge CAD Centre and CAM-I. Topics will include appraisal and justification of CAD/CAM; introducing CAD-CAM into companies; achievement in CAD/CAM case studies; developments in graphics and related hardware; and developments in software ability. Details from the Institution of Mechanical Engineers, 1 Birdcage Walk, London SW1 9JJ.

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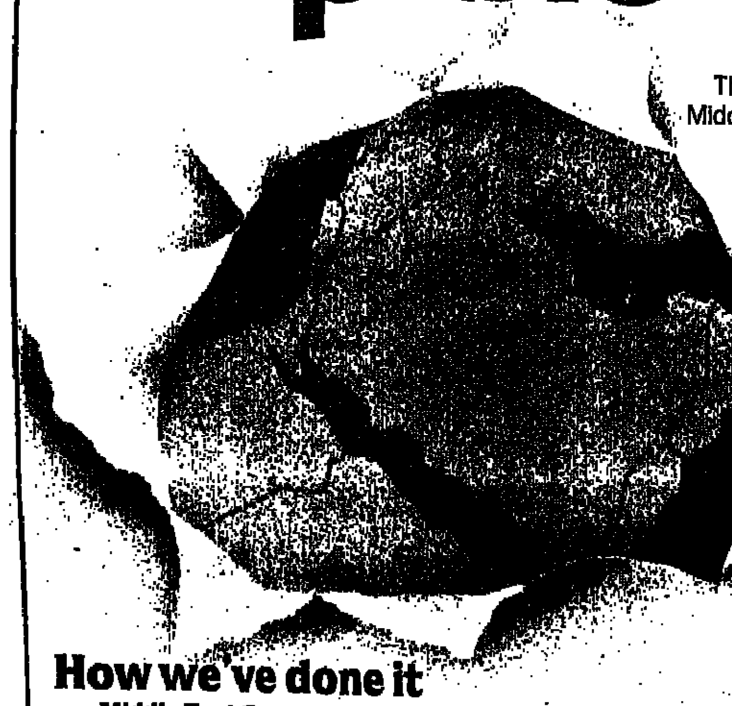

The arrival of IPC's unique new publication, Middle East Computing, means nothing less than that.

For the very first time, computer users in the rich Gulf States — and throughout the Arab world — have a regular journal reporting on the technology and services available to them, world-wide.

So now you can talk direct — and sell direct — to potential customers throughout this vast, fast-growing market. (A market which imported more than £74,000,000 worth of computer hardware alone in 1980).

How we've done it

Middle East Computing began as a single-issue publication, backing the Gulf Computer Exhibition and Conference at Dubai last December. Its enormous success revealed such an urgent and widespread demand for computer product information that it will be published regularly from April.

6000 copies will be sent to established computer users or key personnel within government and major business organisations, in the Middle East countries predominant in the computer market. The circulation was compiled through the full research resources of Computer Weekly and IPC Business Press backed by contacts made at the Gulf Computer Exhibition.

Middle East COMPUTING

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A Computer Weekly publication

Advertisement Manager: Harry Hutson, Middle East Computing, Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS Tel. 01-661 3500 Ext 8839

PRODUCTS

Modem puts systems online to Prestel

DESIGNED for use mainly with videotex and viewdata systems, public or private, is a new competitively-priced auto-dial modem from Zycor.

Teledek CI enables word processors, micro, mini and mainframe computers to go online to systems like Prestel. In this way access can be obtained to databases, external and internal, or messages exchanged by machines of different standards, eg via Prestel's Mail Box Service.

From the computer keyboard the user can instruct the CI to dial automatically a remote viewdata computer. Once contact is established, data is displayed on his screen and, again from the keyboard, he can interrogate the database.

In tele-shopping and similar applications, a microcomputer connected to Prestel via Teledek CI could automatically work through the response frames, process the data, print packing and address slips, raise invoices, and even update stock and accounting records, says Zycor.

Teledek CI makes it possible for computers using different communications standards to talk to each other since it incorporates a protocol converter, in addition to autodialler and modem functions.

It connects to the office computer system, micro or word processor via a standard input/output port.

"The Teledek is expressly designed for continuous business use yet, at about £400, it is less than the first two years' rental of a British Telecom modem, which does not even have auto-dial or protocol-changing features," claims Ken Williams, Zycor managing director.

Zycor (CW), Gateway House, High Street, Slough, SL1 1NB,

14in disc drive from Fujitsu

A 14-INCH Winchester-type disc drive with 168.5 Mbyte unformatted storage capacity and 27 milliseconds average positioning time is available from Fujitsu.

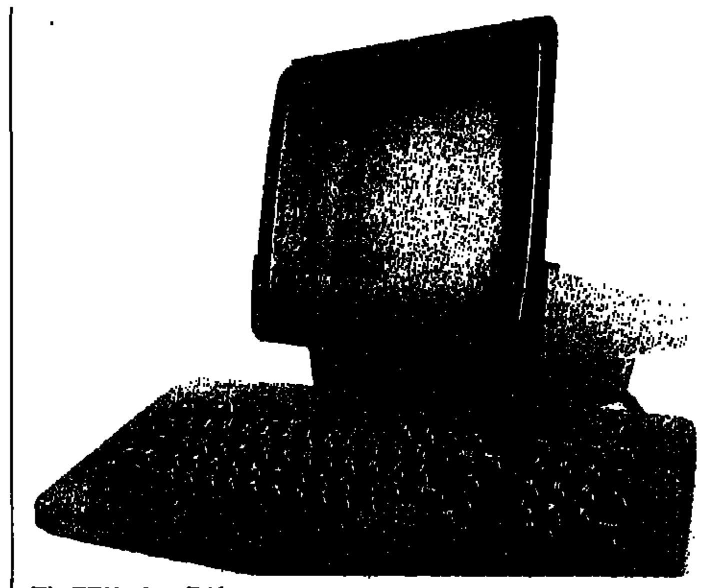
The M2284N offers large storage capacity — 832 cylinders with a 20,480-byte unformatted track capacity. The track density is 680 tracks per inch.

The use of a high-speed rotary actuator results in fast head positioning: 6 milliseconds for track-to-track, 27 milliseconds average and 55 milliseconds maximum, and a high data transfer rate of 1.012 Mbytes per second.

The M2284N is a member of Fujitsu's 14-inch Winchester-type fixed disc drive series, called M228X. Some models have fixed heads for faster access.

They are available with power supplies of either 100/115VAC or 200/240VAC.

Fujitsu Europe (CW), 54 Jermyn Street, London SW1. Tel: 01-493 1138.



The TT100 from Trident.

Trident launches a look-alike

FOLLOWING the introduction in March of Graphmate, a free-standing graph plotter, Trident now announces the launch of a DEC VT100 look-alike terminal.

The terminal, the TT100, offers all the features of the DEC VT100 plus substantial additional options included as standard.

The TT100 will sell for substantially less than the DEC equivalent machine including all additional features, says Trident.

Over 150 TT100s are already installed with major DEC users.

The TT100 will be marketed through Trident Technology, a wholly owned subsidiary of Trident Computer Services.

Trident Computer Services (CW), The Parade, High Street, Frimley, Surrey. Tel: 0276 64252.

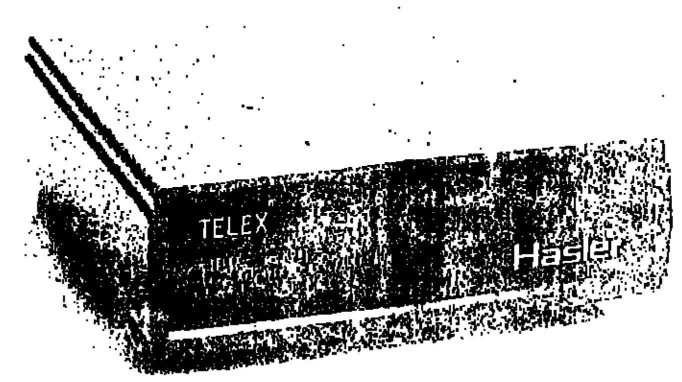
TA speeds up the Alphatronic range

TRIUMPH ADLER is adding speed and storage power to its range of Alphatronic microcomputers with the introduction of the Alphatronic P2U. This machine is an upgrade of the P2/64K microcomputer, but includes integral twin double-sided, double-density floppy disc drives to provide a total disc storage capacity of 720 Kbytes. Priced at £2,295 including VDU, the P2U is one of the lowest priced microcomputers in its category.

Adding further scope, Triumph Adler has introduced an IEC bus (IEEE interface) which enables Alphatronic users to link their microcomputer to a wide range of IEEE-based peripherals and instrumentation. The price of the interface now available is £150.

A real time clock option further enhances the use of Alphatronic microcomputers for applications requiring time logging and is available at £70.

Triumph Adler UK (CW), 27 Goswell Road, London EC1M 7AJ. Tel: 01-250 1717.



The Telex Interface Unit.

'Unit will cut telex bills'

A GENERAL purpose Telex Interface Unit from BCC will allow mini- and microcomputers and word processor users to communicate with telex subscribers anywhere in the world. It is designed, developed and manufactured in the UK by Hasler,

The Telex Interface Unit provides automatic dialling and redialling and incoming message distributor facilities. This enables the user to prepare, enter and receive telex messages on his own terminal, thus eliminating the costly delays and frustration often caused by paper tape punching and handling, manual dialling and redialling and manual distribution of incoming messages.

Nigel Coster, marketing director of Business Computer Centre, says: "The Hasler Telex Interface Unit will prove to be a real cost-cutter

Business Computer Centre (CW), 26 Eastcastle Street, London W1. Telephone: 01-580 4273.

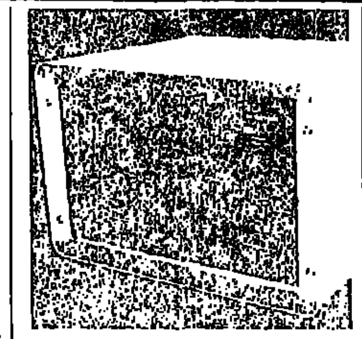
Tri-density magnetic tape unit

A HIGH-SPEED, tri-density magnetic tape drive has been added to the Harris product line. The new Model 6730 features a speed of 125 inches per second and densities of 800, 1,600 and 6,250 bits per inch.

Compatible with the entire current family of Harris' high performance VOS super-minicomputers, the 6730 is cabinet-mounted and includes a formatter/controller unit. This controls both functional and diagnostic modes through a built-in microsequencer. Since the unit is built directly into its own cabinet, there is more space inside than in standard rack-mounted units, providing easy access for maintenance functions.

Price of the Model 6730 is £34,840.

Harris Systems (CW), Information Systems International Division, PO Box 27, 153 Farnham Road, Slough, Berks. Tel: (0753) 34666.



The Datastore from ATS.

Intelligent telex store

AN intelligent data buffer capable of connection to the telex network has been launched by AIS (Communications). Called Datastore, the equipment has a 324K store which can be divided into six 54K individual units to be used separately or together.

This means that it can be used for several different functions at once.

ATS (Communications (CW), Bridge Road, Haywards Heath, Sussex RH16 1UB. Telephone: (0444) 41911.

Autonomy for offices

A RANGE of modular bank terminals designed to provide new levels of autonomy for branch offices has been announced by NCR.

Called the NCR5000 series Branch Automation Systems, they use 16-bit Motorola 68000-based controllers capable of supporting a variety of activities at once, including word processing, data entry and programming in Cobol, Pascal or C.

Up to 32 visual display units or printers can be connected to the largest of the three controllers in the range, the £5,500 5094, via a 48 Kbit-per-second lightweight telephone cable up to 12,000 feet long.

Sales manager Andrew Chard said a typical two-cashier bank or building society branch could be equipped for £8,000 and a four-cashier branch for £12,000. The controllers would also support NCR cash dispensers.

The systems will be made in the US, but will be available both in the UD and the UK in the autumn. One of the first pilot test sites will be the Chelsea Building Society early next year.

NCR Ltd (CW), 206 Marylebone Road, London NW1 6LY. Tel: 01-388 8244.

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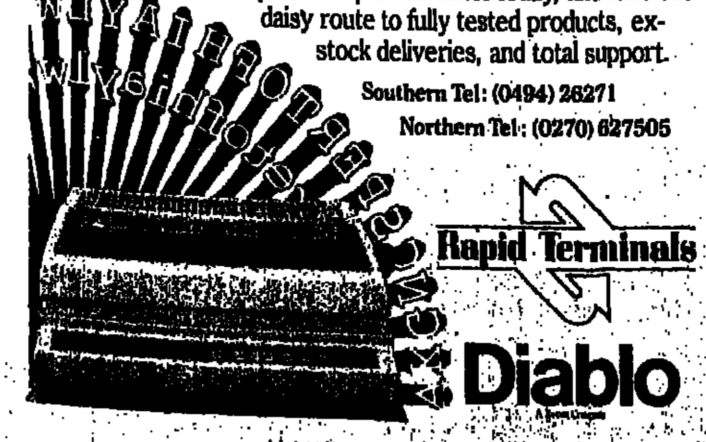

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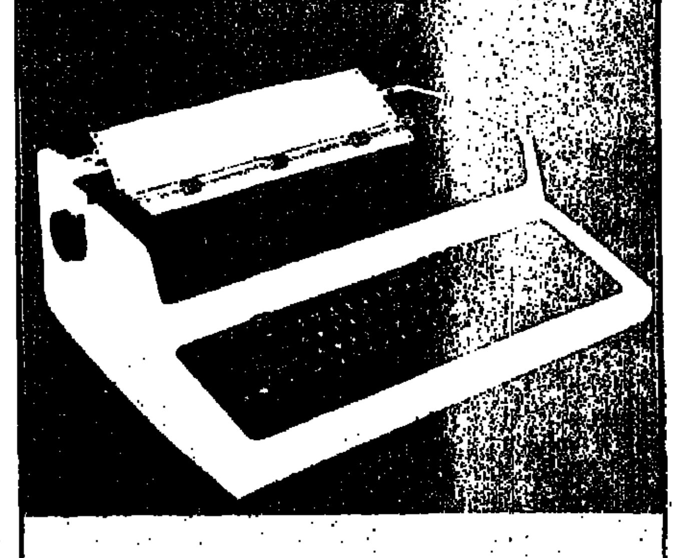

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BCS study on computer evidence cited in court

Computer Generated Output as Admissible Evidence in Civil and Criminal Cases. Edit. T. R. H. Sizer and A. Kelman. Heyden & Son. £7.00.

HIGH Street cash dispensing machines are now an accepted part of life, and most people feel that they are as reliable and secure as any other part of the banking industry. However, as the law now stands there is no guarantee that a prosecution for fraudulently obtaining money from a dispenser would succeed, because the evidence of the crime would come direct from a computer and this could be inadmissible in law.

Worrying facts such as this and the result of the Pettigrew case, in which proof of a burglary resting on a computer listing of bank note serial numbers was ruled inadmissible evidence, led the British Computer Society to commission a report. This book has been taken and adapted for non-legal readers from this report.

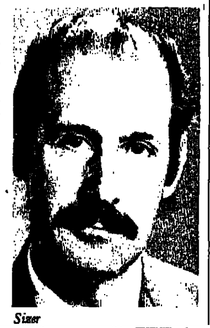
Richard Sizer, a chartered engineer, and Alister Kelman, a barrister and Fellow of the BCS, led a small group of the Professional Advisory Committee in a study of the legal and computing problems and submitted a report to the Home Office a year ago.

Needless to say, the government has been slow to respond, and in the interim period, the BCS report is being cited or is forming part of the pleadings in at least two current court cases.

The authors describe and analyse, with a minimum of legal or computer jargon, the law as it now stands and the main problems to be overcome in changing the law to accept computer output. As an example of how it could be dealt with, methods adopted in the US and Australia, both fellow Common Law countries are described, highlighting statutes which might be of assistance in the UK.

This book should be compulsory reading for all systems designers, as well as barristers and solicitors, because the conclusion drawn by the authors is that development standards between systems will become vital in proving the accuracy of computer output, in order to get it accepted as evidence.

Maggie McLening



Sizer

Teaching the latest Fortran

Fortran 77. Donald M. Monro. Edward Arnold. £9.50.

FORTRAN 77 is a manual for teachers to use both with programmers experienced in other languages and students approaching programming for the first time.

Emphasis is on structured programming, now more feasible since the development of this latest version of the language. Efficiency and style is taught through practice.

Chapters 2 to 13 form the main body of the course in basic Fortran 77, with the early chapters including enough information to enable the student to start writing simple programs straight away. Chapters 16 to 19 deal with advanced aspects of the language.

Exercises to help the student consolidate his or her knowledge occur every few pages and there are problems to help both student and teacher assess progress.

Rosemary Shepheard

Art of management — Japanese style

The Art of Japanese Management. Richard Tanner Pascale and Anthony G. Athos. Allen Lane. £7.50.

ANY book which opens with the comment "This is an important book" immediately puts the reader on the defensive. Readers will continue to be on the defensive as they grapple with a volume which features a wealth of conceptual schemes, emphasises interrelationships and discusses variables. This approach, however, is hardly surprising given the authors' backgrounds at Harvard and Stanford business schools.

Before attempting the book, a management consultancy course in The Seven S Framework is advised. This embraces strategy, structure, systems, style, staff, sequencing and superordinate goals. Unfortunately, the book can only rate as a near miss, with the authors scoring several own goals, the most notable being a fondness for dated references, some of which go back to 1938.

In tackling the subject of Japanese management, the authors have an uphill task. We all understand that the Japanese worker is placid, hard-working and part of a well-established and maintained feudal system.

But the book makes clear that the management techniques that have made Japanese companies so highly productive are not necessarily culturally based.

Backed by Wells Fargo and the Coca-Cola companies, the book contrasts the management approach of American companies like IBM and ITT with Japanese conglomerates such as Matsushita and Honda.

With the Japanese taking an ever larger interest in the European computer market place, the book makes a useful contribution to understanding the differences between American and Japanese management. Providing the reader can master the management consultancy approach and style, and the Seven S Framework, the book provides a useful insight into management styles.

Alan Simpson

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For further details about exhibiting at the Northern Computer Fair, contact the Advertisement Manager, Practical Computing, Room L310, Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS. Telephone: 01-661 3500 Ext 3021

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Company
Address
Telephone

Essential reading for postgraduate students

Functional Programming and its Applications: An advanced course. Edit. J. Darlington, P. Henderson and D. A. Turner. Cambridge University Press. £12.50.

THE content of this book is compiled from material presented at a Crest course held at Newcastle University in July last year. Ten of the lectures on the course each provide one contribution for the text, but these blend together effectively to give a comprehensive treatment over the chapters.

Functional languages are advanced as a superior alternative to conventional programming languages for the production and maintenance of reliable code and it is suggested that they are now a realistic practical proposition with recent hardware developments.

A number of functional languages and their application are discussed, including the traditional Lisp, and implementations of functional languages are considered. Several contributors deal with the development and style of functional programs.

Functional operating systems, computer architecture requirements and capabilities also receive coverage. The mathematical underpinning for functional languages and aspects of its development are clearly expounded.

The book is clearly written throughout in a variety of styles. However there are unnecessary variations in typography, presumably deriving from each contributor's "camera ready" copy. Familiarity with set theory, logic and modern algebra is essential for the formal aspects but the other sections are accessible without such an emphatic requirement.

Some of the material in the book will be of value in a final year specialist computer science course. It will be essential reading for the postgraduate student and researcher in the functional programming field. It should also find a place on the bookshelf of anyone professing an interest in the development of programming and programming languages.

Tony Powell
Wolverhampton Polytechnic

More than just a guide to computer design

Advanced Computer Design. J. K. Iliffe. Prentice Hall International. £18.95.

THE title Advanced Computer Design suggests a book on the DAP, Cray-1 etc. These are dealt with in the text, but it starts sensibly with more familiar architectures, the PDP-11 and ICL 1900. These are covered in the first part of the book which shows how interpreters for these architectures could be constructed.

Several chapters are concerned with the proposition that modern computer design can improve on traditional ways of implementing high-level languages. In this context, micro-programmable machines, bit-slice processors (the AM2901), direct execution of languages and case studies of Fortran, Cobol and VCS are discussed.

Throughout the book no direct reference is made to microprocessor design and while it may be better to draw a veil over the design of the 8-bit micros, the iAPX 432 is a significant omission in a discussion of architectures designed for the speedy execution of high-level languages.

The second part of the text introduces the concept of high speed data handling by vector processors such as the FPS AP-120B and Cray-1. Array Processors are discussed, Illiac IV, rather too briefly. Towards the middle of the book is the active memory array system as typified by the ICL DAP and appropriate programming techniques for such machines. Their place in the design of general-purpose systems is examined. This is the most readable, clear and enjoyable part of the book and is recommended to anyone who wants an introduction to the principles of array and vector processors.

The last part is concerned with structuring techniques and abstraction. It deals with mechanisms for supporting program modularity, controlled resource sharing, parallelism, protection and error handling. Because this area seems more in advance of current practice-of-the-art in machine design it reads less well and seems less clear.

This book will have considerable value to anyone interested in computer design. Highly recommended.

Valerie Cordingley

SOFTWARE MONTH

PAYROLL

Personnel due for a facelift

PAYROLL, that most taken-for-granted of software applications, is due for a facelift. Changes in the administration of sick pay mean that payroll systems all over the country will have to be revised, updated, and brought into line with the new requirements by April 1983.

In this issue of Software Month Cliff Dilloway, a consultant specialising in payroll and personnel applications, looks at what the changes in law will mean, and how users can best cope with them.

Payroll lends itself to packaging. The mechanics of paying out a cheque at the end of the month seem a simple enough process, and software vendors have been quick to pounce on packaging the software. For many people, the computerised payslip was the first contact they had had with computerisation of any sort.

But like all packaging, the payroll package carries a penalty for its convenience. Because it affects people directly it has to be accurate and reliable, and because it is run every month it has to be efficient. The number of authorities (besides the employee and the employer) interested in what goes on to that payslip means that there are always rules by which the package must abide.

When the rules change — as they will when the new regulations are introduced next April — that means an enormous overhead in updating the existing payroll package. This effort, often euphemistically called "maintenance" can make an old system more trouble than it is worth.

One of the most persuasive reasons for investing in some new software is the so-called information revolution. Gradually companies are beginning to realise that, next to their staff, their most valuable untapped resource is information.

The payroll system is a good case in point. Many people consider a payroll (or even a fully-fledged personnel) system as totally separate from anything else the company might do.

In fact, the personnel information has many links with other mechanisms used by a company. For example, a system which records sales activities per salesman can link with the payroll. Come the end of the month, it is possible to gather from existing information the extra data needed by the payroll to add commission to the payslip.

Once an integrated system is up and running, it is likely to expand to encompass other areas of company activity. This involves the automation of tasks such as the addition of commission to the payroll. It also makes possible new jobs which cannot be done when each application is a satellite to its own separate nucleus of data. The benefit is a more efficient, productive company.

Dilloway looks at the new problems introduced by the changes in statutory sick pay, and what impact they will have on payroll systems that are already computerised.

Since ready-made packages appear to be the answer to the problem, both mainframe and micro solutions are assessed. Dilloway also gives a practical, down-to-earth guide to the steps wary package buyers should go through before they commit themselves to buying one particular package.

There is also a guide to system conversion, since converting one system to another can be a worse job than starting from scratch, and a few hints on how to avoid total disaster when the big day — April 6 1983 — comes round.

Be prepared for maintenance costs.....22
Getting to know a package.....23
Round Up.....23
Softsell on selling your program.....24

● *Software Month is edited by Claire Gooding.*

Cliff Dilloway opens this four-page feature with a look at the problems presented by an imminent change in the law

Statutory sick pay will mean quick and difficult decisions

EVERY dog has its day, and 1982/3 promises to be the year of the payroll. Payrolls have not had a look in since 1974/5, and then, as now, the reason is a statutory change. In 1975 it was the introduction of unified income tax; in 1983 it is the introduction of statutory sick pay.

The 1983 change promises to be a bigger job. The programming will be much the same as in 1974, the file changes are extensive, but statutory sick pay also impinges on personnel systems.

Whereas sick absence is a personal matter, sick pay is a payroll matter. Both need to record a history of sickness absence for their own reasons. Difficult systems decisions have to be taken with a chance there could be problems later if the wrong choice is made.

The principle of statutory sick pay is simple enough. Dependent on average earnings over the last eight weeks, payment is made at a scale rate. The first three days sick carry no entitlement. A further sick absence within 14 days is paid from the first day. A maximum of eight weeks statutory sick pay is paid in a year, after which the individual becomes entitled to National Insurance payments.

The details of statutory sick pay are all given in an employer's guide that is not available at time of going to Press, but should be released within a few days. The details will doubtless be fearsome and require extensive study. Employers will be able to recover their statutory sick payments from the government out of their National Insurance contribution remittances, so there should be no direct cost.

The difference is that it will focus attention on the cost of absence and that is where the personnel system comes in.

If the systems dealing with statutory sick pay ignore the personnel systems aspects, it is at the risk of needing considerable changes later. There are difficult decisions to take, and quickly, because statutory sick pay comes into effect on April 6 1983.

Historically, payroll was the first computer application. The first payroll of over 10,000 weekly employees was operational as long ago as 1955. Payroll packages started to emerge about 1970, and after 12 years of commercial development they have become quite sophisticated.

Personnel systems are not so well developed. There was a big impetus a few years ago in the US when legislation imposed mandatory reports, but without that absolute requirement there has been little movement in the UK. Things are now changing.

The recession and the pressure of increasing salaries have meant that labour-intensive industries have to consider how they use their human resources more carefully.

The larger the computer used for payroll the more likely it is that well established in-house written programs are being used. The case for altering those programs is strong, even if the task is daunting. The payroll section is familiar with its operation and there may well be some built-in facility that represents an unusual way of working that would be difficult to emulate in a package.

A payroll package is the second choice. Since 1974 all mainframe payroll packages have been so much developed as to constitute a rewrite. The long history of payroll development has resulted in a degree of sophistication that has not yet been reached in other applications.

A way out is to put the payroll on a bureau and let the payroll section input its own data through a terminal. The bureau can take on the workload of training the payroll section.

Not all the bureaux have systems to handle both payroll and personnel records. Sometimes it is one that is the leading product while the other is the poor relation. What is needed is a system that is sufficiently integrated that the problem of having separate files is avoided.

A similar result but different solution can be obtained by providing the payroll section with its own standalone mini. If payroll will accept the responsibility of running a machine of its own then it can seek its own salvation.

An advantage of payroll section having its own computer is confidentiality of the data. Once the door is locked on its office then payroll details are as secret as they ever were with the manual records of long ago.

Which of these solutions is preferred becomes a matter of cost, the time it would take to do the job, and personal choice.

Since most people, particularly payroll people, usually rise to their responsibilities it is worth giving them everything they can take. This would mean a dedicated computer in the payroll office.

There is a final point for the farseeing who have time to consider it: the pension system. A pension file nominally only needs an annual update. Data may be needed more frequently in respect of retirements, deaths in service, termination or redundancy exercises, but these are usually viewed as one-off ad hoc calculations whenever they occur.

SOFTWARE MONTH

MILLS . . . Believes in payroll commitment to customers.

Payroll package buyers must be prepared for maintenance costs

THE mainframe payroll packages are well established and there are a few dominant suppliers. Below the mainframe level there are many payroll products on offer – most, but not all, tied in to just a few makes of computer or operating system. Doubtless the micro-mini marketplace will gel like the mainframe market and the introduction of statutory sick pay will be a catalyst to the suppliers.

The leading mainframe payroll package suppliers and a sample of suppliers for smaller computers are listed on page 23.

The market leader in mainframe packages is Peterborough Software with its Unipay package. Peterborough Software is British software house specialising in related applications packages. Managing director John Mills believes in a payroll commitment to its customers and says: "We supply a continuing service on a rental basis. We have to be in the habit of selling ourselves to all our customers all the time.

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Perhaps that is why we are Number One."

Pushing Unipay hard in the marketplace is MSA with its Q-pac payroll system. Q-pac, which is of South African origin, has been in the hands of three different suppliers in the last 10 years and this has not done its market image any good.

Dan Schmitt of MSA says: "Q-pac has a leading position in the marketplace because of the overall flexibility of the package linked with the obvious advantages of a company supplying a full range of integrated financial systems who, in turn, are the owners of the software they market and not merely agents."

The third package in line is the PPL-Cyborg system. The product is based on a US package that has been modified by PPL using the experience it gained while responsible for marketing Q-pac. Its success supports the belief that the important ingredient in package development is product and market knowledge rather than some intrinsic power in the products programs.

Tim Southern, PPL's managing director, says: "Our late start has enabled us to provide a modern system using today's techniques which provide the facilities the market needs in the Eighties and consequently we are taking customers off our competitors."

Last, but by no means least, is K-Paye offered by KCS. K-Paye is different in kind from the other packages described below. Managing director Geoff Knight, whose name provides the K in K-paye says: "There is a tremendous demand for online file maintenance and batch running of payroll. Our product meets this demand on a range of many minis up to the largest 360s."

Unipay, Q-pac and PPL-Cyborg are parameter-driven systems. Users each have the same programs and specify their requirements by means of parameter or control statements. The three competing systems are continually leapfrogging each other with enhancements so that the capabilities of the systems are tending towards being roughly equivalent.

It is hard to find a well-established facility in any of the three systems that cannot be closely matched by the others. There is a strong inclination on the part of each supplier to provide an enhancement to plug any gaps that are revealed when a sale is lost.

K-paye has only a small amount of parameter control. For requirements outside the coverage of the parameters KCS will provide a source code module. KCS is organised to supply and support these modules to run on a wide range of computers and also to provide an ongoing support and maintenance service. The price of the KCS package is likely to be lower than the other packages mentioned and the possibility always exists of users being able to be involved in the source code maintenance.

Below the mainframe level there is a wide choice of software available and prices are just as varied. If a computer is being acquired for the purpose of payroll, then it is advisable to choose the software first. Ian Duffy of Wisbech Computer Services, a payroll specialist company, says: "We are providing mainframe equivalent facilities on a CP/M micro as a standalone computer for the payroll department. It is very attractive for them to have their own machine under their own control."

For those that already have a computer, trade sources will lead them to the packages they can use. One word of warning: Statutory sick pay could require as much file space per employee as is required for all other payroll purposes. On small computers this will reduce the number of employees that can be handled.

There are so many payroll packages for small business computers that finding which one is best for you is well nigh impossible. Price is no guide at all. The good package going for volume can be cheaper than the piece of rubbish with owners having exaggerated ideas. The market has not been active long enough for a price profile to emerge.

To make your selection modify the strategy given on page 23 and expect to have to get two or even three packages paid for and working before you settle on what suits you. Keying in the names and P45 data for even 300 employees is not too big a task and actually using a package is probably cheaper than spending a lot of time trying to make the right choice by abstract thought.

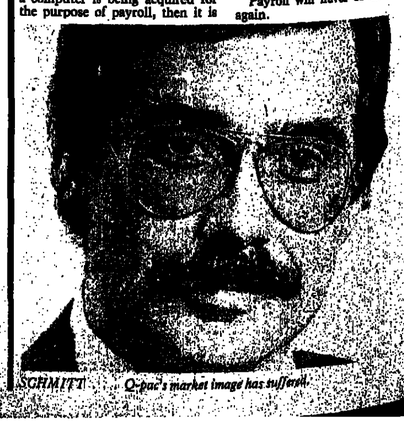
Find out whether the maintenance offered will be adequate. The surest test is a commercial one. The regular maintenance income from a reasonably-sized user base is a commercial asset. Whatever disasters befall the package's proprietors, someone will acquire that commercial asset and your maintenance service is assured.

Expect to pay 25% for payroll maintenance as against the more usual 10% for accounting systems.

Package maintenance usually involves the distribution of complete new copies of the programs to all users and, surprising as it may seem, will often be necessary four or five times a year. Take out a maintenance contract and bring the new programs into use when they arrive.

The introduction of statutory sick pay will have a significant impact on the supply of payroll packages. It will stimulate an interest in personnel systems to which it is related through the recording of employee absence data. Personnel systems have implications for data protection with a desire to lock the dedicated computer up in a secure room or, perhaps, put it under the security protections offered by an outside bureau.

Payroll will never be the same again.



SCHMITT . . . Q-pac's market image has suffered.

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Enhances the performance of both system and application program modules. TSA analyses and reports on CPU utilization so that inefficient coding techniques can be quickly identified and corrected. The PPE feature is then applied to those programs and provides a detailed analysis of the actual code efficiencies. The results are better overall systems performance, response times and user service levels.

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JCLCHECK is a systems utility that provides dramatic savings of both CPU and personnel resources by identifying all job stream JCL errors and many run-time abend situations before test or production runs. JCLCHECK speeds production turnover and saves personnel time.

TONE (Interactive Programming System)

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FSO provides the 3270 display terminal user with a set of extremely powerful and flexible commands to conveniently review spooled input and output and to determine the status of all jobs in the system. More than 70 commands are available to the system programmer.

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Production Manager	☐	☐	☐	☐	
Systems Manager	☐	☐	☐	☐	
Appl. and Prog. Manager	☐	☐	☐	☐	
Security Manager	☐	☐	☐	☐	

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There's only one way to get to know a package – use it!

IT IS a common experience to realise that you are really only just getting to know a package after you have been using it three months. It is by no means unusual to give up a package after six months having finally come to the conclusion that it is not capable of meeting one of your basic requirements.

This persistence is in part caused by an unwillingness to accept defeat, partly because of an unwillingness to accept that the wrong choice was made, but mainly because of the near-impossibility of appreciating what a package can and cannot do in a short evaluation period. There is a lot of interaction in a package and it takes practice, experience and learning to get the hang of it all.

As most of the problems drop away during the learning period, we all live in hope of it coming right in the end, but sometimes it never does.

Checklists and formal selection procedures are essential to ensure that you are not buying a package from someone about to go out of business, who does not own the copyright anyway and whose training courses are given only in Greek. At a practical level, you need to know if the package really does what you want, and can you get on with the support personnel?

This last point does not usually appear on the checklists. But it is not unknown for companies to get phone calls requesting that certain support personnel are not sent again, in case particular individuals get thrown down the stairs. Ask no names: the individuals concerned are now both managing directors of software companies.

The practical problem is this: How do you get to know as much about a package in a three-week evaluation period as you might otherwise learn in three months of use? There is only one answer – use the package. Set yourself a target of at least six demonstration payroll runs. Keep your intention from the salesman until after you have trapped him into saying that his package is easy to use.

A demonstration payroll need only consist of six employees. Each demonstration employee can be an anagram of the three employees with the most complexity on your payroll. Use their live data, choose someone else's surname and pick the forenames from someone else again. You do not have to invent test data if you confuse the origins of the real data you use.

Collect this data before you ever meet the package salesman and run it through your existing procedures and programs to obtain the test results. There is no point in doing work that the computer can do for you.

Until your payroll data has been run through the package(s) you are considering, the time you spend with the payroll package salesman and his support analyst is not effitely productive. You need to learn about his package in relation to your data. The salesman has his concepts, philosophy and nice neat payroll example to sell. Not uninteresting perhaps, but not quite what you want to learn.

We all learn things in relation to what we already know, so starting with your own familiar payroll data just means that there is not only a base on which to build, but less to take in. These remarks are more applicable to payroll than systems people, but nevertheless have some relevance to all learning situations.

Ideally, and if you have time, set up a demonstration payroll on more than one package. Setting up a package yourself involves such close working with the supplier's staff that you will find that human relationships begin to cloud your objective judgment. Give due weight to your natural prejudice in favour of the first system you set up.

Find out how much depth of support there is at the supplier you are working with. Judge how willing he is to allow you to build up confidence in what he is selling by means of a demonstration.

Surprisingly, some suppliers expect you to spend tens of thousands of pounds on intangible software that you have only been able to understand conceptually.

If the software is priced at £250, you must expect to pay first and try out afterwards, and there is a considerable risk of not getting your money back if the product is not to your satisfaction.

The initial purchase price is not the only cost you are going to incur with your new payroll system. Your own costs can be significantly affected by the case of use and general efficiency of the package you buy. Remember that your costs arising from the use of the package are many times greater than what you are going to pay the supplier, so seek fine tuning and efficiency possibilities that you can use in the years ahead.

Having identified the points that you like, make sure that they are referred to in the contract. Do this by having the demonstration payroll as well as other documentation referred to in the contract and strike out any "entire agreement" clauses. You cannot expect damages if the software package does not turn out to be what it was sold as, but you should at least get your money back.

Having bought a package, stop fighting and put your efforts into making it work. There are two tasks facing you. Setting up the control or parameter information to suit your convenience and then setting up the employees on the master file. One of the more im-

● Turn to page 24

Payroll package market

MAINFRAMES

Company	Typical price
K-PAYE (KCS 01-680 7474)	£4,500-£8,000
PPL-Cyborg (PPL 01-633 0121)	£15,000 for 1,000 employees. Add 10% per additional 1,000 employees
Q-Pac (MSA 0628 71011)	None available
Unipay (Peterborough Software 0733 41010)	Rental £4,000 plus £175 monthly

MICROS TO PERSONAL COMPUTER

Damanpay (Daman 061-793 7015) CIS Cobol, RP/M	£350
Datasense (01-803 7400) IBM System/38	£2,500-£6,000
Payfact CMG (Haslemere)	£2,787
Payroll (MPSL 01-831 8811) Microcobol	£400
Payroll Plus (Landsoft 01-878 7044) Pet	£150
Paysense (Selvern Systems 0376 519413) CP/M	£500
Peachtree (0628 32711) CIS Cobol	£600
Pet – Listing in Practical Computing April 1982	
Wispay (Wisbech Computer Services 0954 64146) Northstar Horizon CP/M	12½p per person/week

ROUND UP

SOME recent events in the software industry you may have missed:

■ A committee to advise on software and copyright and to help safeguard users in the UK has been set up by the **Computing Services Association** for its members. One of the first things the committee will look at is the wording of contracts involved in recent disputes about claims to original ownership of products.

■ UK systems and software house **SPL International** has signed up **Intelligent Industrial Systems** of New Jersey to market its products in the US. The deal will add momentum to SPL's US marketing campaign. IIS will initially distribute SPL's RTL/2 high-level language, and the Magic microcomputer software package.

■ US software house **ABC Management Systems** is suing the international **McCormack & Dodge** for alleged piracy of one of its software packages. AMS claims that M&D broke a licensing arrangement to sell its ABC System, a modelling tool, solely within the US.

■ **ICL**, is considering the use of the logic programming language Prolog for its Contents Addressable File Store (CAFS) controller, which enables selected data to be retrieved from a base at disc transfer speed. Talks recently took place between ICL and an Imperial College team headed by Robert Kowalski, which has developed a version of Prolog.

■ Rapid growth of business graphics is reflected by a spate of orders received by **Issco UK**. This month orders have been placed by **Lockheed, Standard Oil, Citibank**, and the **Salk Institute for Biological Studies**.

■ UK systems house **CAP** has offered a cheaper software alternative to the non-stop systems of **Tandem** and **Computer Technology**. Called Magus, this software will link two PDP-11 or VAX-11 computers so that programs run on one will be mirrored on the other.

■ Communications company **Racal** has set up an expert systems division. Initially Racal will develop customised expert systems for the oil industry, but will later branch out into other applications of machine intelligence such as medicine.

■ Seven new software products for the **Stratus** failsafe computer system have been put on the market. They strengthen the challenge of Stratus to rivals in the market Tandem of the US and Computer Technology of the UK.

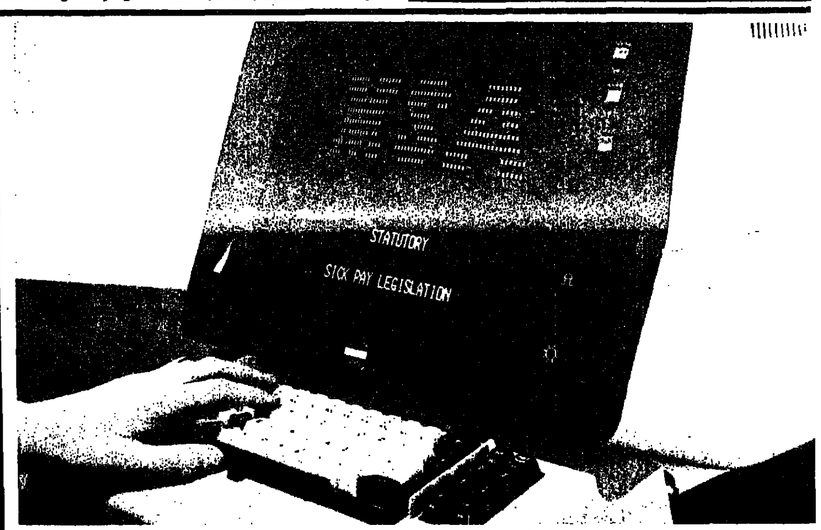
■ "You can sleep with an elephant until it rolls over." This is how **Management Science America**, the world's largest software house, sees its relationship with IBM. "Right now I regard IBM as an ally," says John Imlay, chairman of MSA. "But I emphasise right now."

■ **Zilog** has introduced a new word processing facility to its System 8000. The Uniplex package builds on facilities already provided by the Unix operating system on which Zilog based the Z8000 OS Zeus.

■ **Bradford University** has followed up the success of its independent **Software Services** company with the launch of **Technology Transfer Services**, to market programs developed by the Postgraduate School of Studies in Industrial Technology.

■ **ICL** sent a large delegation to the recent World Computer Services Conference in Copenhagen, including Tim Holley, director of financial services, and Basil Cousins, manager of software products. ICL held talks there with over 100 European software companies.

■ A full range of software, including word processing and database management, will be launched with **Commodore's** new business machine in September. This will give the new 720 machine, announced at the Hanover Fair in April, added ammunition in its fight for the 16-bit market, contested by the **IBM** Personal Computer, the **Sirius I**, and **Apple III**.



"Is your payroll system this healthy?"

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CWSM

SOFTWARE MONTH

The kind of program that can be brought to market . . .

Ferris is a consultant in the UK and US providing marketing and planning advice to computer vendors, particularly in the area of software.

MANY people are hoping to find fame and fortune by selling a program they have written. If you are one of these aspiring vendors, be sure that you are familiar with the two big differences between a piece of customised software and a program product.

Dennis Vohs, in charge of software development for financial applications vendor MSA, explains the first difference: "Writing software which reflects the needs of a single organisation at a particular time is utterly different from writing software which will be able to service a wide variety of organisations over an extended period.

"For example, if you are de-

SOFTSELL

veloping a payroll system, you have to take into account all the different possible ways of making deductions from employee pay cheques . . . It is a very hard task to allow for them all. Packaged software has to be far more flexible and general than custom software".

The other major difference lies in the key role of support and maintenance for the vendor. As Bob Goldman, responsible for development at DBMS vendor Cullinane explains: "The question of ongoing support and enhancement is absolutely crucial.

"Bug fixes and new features have a very strong tendency to reduce software quality and ultimately destroy it, and given the fact that a package is continually being altered, it is important to plan for change in product design."

To handle these problems, package developers have to spend a lot of time at the design stage – far more than is required by customised software. A great deal of thought has to go into all the possible ways the product can be used, and how it will evolve over time. In addition, major efforts have to go into documentation.

For most customised software, documentation ends up being a last-minute, low-budget affair, but for software packages, it generally requires about as much effort as the actual coding and debugging. In other words, if all you have got is a debugged piece of code, you are still miles away.

So what is so social about a software package? The remainder of this article looks at the kind of program that is capable of being brought to market.

Parameterisation. Wherever possible, anything likely to be changed – whether by the vendor implementing enhancements, or by users tailoring their own environment – should be capable of change without alteration to the code.

Such software is often called "table-driven". So for example programs should contain list-processing logic instead of explicit search instructions such as:

```
IF EMPLOYER-CITY =
LONDON OR EMPLOYER-
CITY = WASHINGTON
THEN DO SPECIAL-PROCES-
SING.
```

By writing software in this way, alterations can often be made by simply adding a new element to external data structures, without necessitating any program modification.

Isolate sensitive code. If danger areas cannot be parameterised, perhaps for efficiency reasons, or compiler limitations, the sensitive code should be isolated into separate modules. These can be separately compiled modules, separate source code modules read into mainline source code at compile time, functions or procedures within a source module, or simply instructions surrounded by a lot of warning comments.

However the isolation takes place, it should be done so as to make future maintenance and enhancement as easy and natural as possible.

Development Tools. By the use of high-level, user-friendly development tools such as report writers and CRT screen formatters, packages are made far more flexible. Future enhancements are often made much easier to implement. If the tools are made available to customers, a far more tailored environment can be developed without draining the vendor's support resources.

Provision for Error Handling. When bugs occur in packages, support staff need to be able to locate their cause. Various things can be done to facilitate this, such as the use of good general purpose error handling routines, and the incorporation of debugging routines to be activated either dynamically or by setting a compile-time switch. When the bug has been fixed, corrections may have to be made at many different sites, so it is important to give thought to how this can be done most economically.

MSA, for example, supplies its customers with a module librarian, and many companies leave unused holes in their executable programs to allow for the insertion of error correcting patches.

Incode Documentation. Clearly, since the original developers may not be supporting the package, code needs to be very well commented. All groups of instructions – whether a separate compilable module or a function or procedure within such a module – should contain a heading explaining what is being done, the inputs and outputs, and interactions with other components. Lines of code should be commented throughout to make them more understandable.

Ease of Use and Training. Some vendors, especially in the mainframe field, make it their normal practice to send staff to train new clients.

However, whether or not this is done, there will inevitably be times when the customer has to rely on his own devices to determine what to do – this is different from custom developed software when often the developers are at hand. Therefore, software package documentation needs to be very full and precise. On the other hand, it needs to be clear.

Authors need to give a lot of thought to the structure of the documentation: what portions to put into different manuals, and what portions to divide into sections of an individual manual. The future success of the product depends in large part on how well they do their job.

Sales Role. When buying a package, many prospects find that listening to the glowing praise of salesmen and reading the effusive descriptions of glossy sales brochures just isn't enough. So they ask to inspect the user documentation, and authors should bear this in mind. It is often necessary to insert a sales-type introduction in reference manuals. These are frequently referred to as "concepts and facilities" sections, when a more accurate title would be "disguised semi-detailed sales brochure".

Internal Documentation. A successful product will have to be maintained by new staff, possibly of average ability. So clearly good internal documentation must be written. There is no set formula for this, but it should be well organised, readable, and contain tutorial sections for those unfamiliar with the product.

Generalised Terminology. Different organisations have different terms for what amounts to the same thing, and where possible terminology should be used which is acceptable to all parties.

For example, when describing organisation charts, MSA refers to "the lowest level of your organisation" and "the next highest level of your organisation" instead of "department" and "division". This principle applies to computer terminology as well as applications, and many systems software vendors in particular make the mistake of introducing gratuitous jargon.

It is unwise to attempt to impose a vocabulary on your customers.

David Ferris

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First Issue, May 1982

Contact Gordon Bradley 01-661 3126

Getting to know the payroll package

● From page 23

portant reasons for the demonstration payroll is that it gives you a base on which to build your operational system.

If you have set up a demonstration payroll on more than one package you know quite a lot about your requirements. All those requirements have to be expressed in the terms of the system you are setting up. Check out what you have set up with three or four pay period runs of employee data. Create an employee master file for the new package by creating literally thousands of input records from your old master file.

A quick and dirty program for this once-in-a-lifetime job will be adequate. Tune the quick and dirty program so that it will always create clean input for the new system. Carry out systems tests on reasonable numbers of employees and then you are ready for parallel running.

Parallel running has two test objectives that can be kept separate.

The first parallel running objective is to see that the calculations and totals are all correct. Achieve this objective by converting the old employee master file and input data again and again each pay period. Totals between the old and new systems are then directly comparable.

The second parallel running test objective is to see that everything correctly carries forward from pay period to pay period. This objective can be met without the necessity to reconcile with the old system. If you try to combine these two test objectives, you are endlessly involved in manually correcting every error you find and then finding the errors you have made in the manual correction.

On April 6 1983, or when you are ready (whichever comes first), cut over to your new system. Have a disaster plan ready that is a bit more highly developed than a contingency plan.

The time to watch is the second run of the new payroll system. Somehow it seems the problems always arise on account of some failure in the carry-forward information, so make sure that your tests are adequate in that area.

And good luck.

Micros have been nibbling at edges of DP empires – managers fell in love with their ease of use, says Malcolm Peltu

Why batch accounting will soon be seen as a deviation from the norm

Systems like the IBM 4300 are signalling the end of the first wave of commercial DP, which has been characterised by batch processing controlled by central DP departments.

The 4300 kind of system places large-scale computing power directly in the hands of end users and makes online the natural way of computing.

By 1985, batch processing will be regarded as a deviation rather than the norm. Online will be the standard computing environment with batch as an option, rather than vice versa.

The 4300 is proving to be a major weapon in breaking down one of the last bastions of batch processing accounting. Historically, financial and accounting tasks were the first to be computerised in most organisations. They are therefore rooted in the batch techniques which characterised early commercial DP.

There is, however, nothing about accounting which makes it intrinsically batch oriented. Even a function like payroll, which has a clear batch element, should be viewed as part of an online database inquiry and updating service.

The real breakthrough in end user computing was achieved by micro and personal computers. Interactive working is the norm for microcomputers. Their low cost and ease of use enabled many people, for the first time, to lay their hands on a computer.

> **'The 4300 will stimulate use of online accounting on mainframes as users become aware of the benefits.'**

Many managers allowed their frustrations with the costs and delays of traditional batch DP to erupt into a love affair with micros. Combined with software like VisiCalc and MagiCalc, which provide basic financial analysis facilities in the form of "electronic worksheets", microcomputers enabled managers to perform many accounting and modelling tasks immediately and on their own.

Microcomputers are now ensconced as an important part of most computing services. But they have been nibbling at the edges of DP empires. With limited data storage, database management and communications facilities, micros are suitable only for tasks with limited, discrete requirements.

What hooked the managers was not so much the microcomputer itself but the immediacy, responsiveness, ease of use and added efficiency which it provided. The IBM 4300 and its competitors provide all these aspects plus the large-scale data handling and communications need required by medium-sized to large organisations.

The typical user of a 4300 regards it as an online tool for direct use throughout the organisation. Accounting and financial requirements form a key part of the benefits expected from any computerisation project.

The user will therefore expect general ledger processing, payroll, financial forecasting, accounts receivable and payable, stock control, financial modelling, fixed assets monitoring and other accounting tasks to fit into the standard online environment.

This is different from the traditional expectation of users in a batch environment. For purely historical reasons, accounting became associated with batch processing because DP started as outgrowths from finance departments.

When cost effective online systems began to become more available in the last five years or so, organisations tended to focus them on new applications rather than disturb their well-oiled batch accounting systems.

The 4300, however, has made a major psychological difference. It will stimulate greater use of online accounting on mainframes as user departments become aware of the benefits of interactive access to large volumes of financial and other data.

The benefits of online accounting are indisputable:

- Accurate answers to timely information. The user has direct control over updating and accessing information in the accounting system.
- This means information is more accurate and responses can be given immediately to inquiries from this up-to-date source.
- Reduced need for professional DP staff. Using systems like MSA's Easy-Screen to produce screen formats and do online calculations, the users can do many routine DP applications tasks themselves.
- User commitment and control. Provided the online system can be used by accountants and others without special training, these users will take personal control over the operation of the system.
- Fewer printed reports. A great deal of information will be received by the user directly on the screen. Where printed reports are needed, the user can decide how much is printed and in what format.
- Efficient system tailoring. With appropriate software aids, the user can tailor the system to local needs, say with a particular format for a report, various languages for screen formats and so on.

For users, these operational benefits are obvious. There are also great advantages for DP professionals, although there will be some cut in the demand for some applications programming functions.

For computer professionals, one of the bugbears of commercial DP is the pressure from users for relatively simple routines which can be boring to implement. With appropriate online systems, the user will get off the backs of DP staff for work in the more boring type of applications coding.

The staff released in this way could move either into business systems analysis or systems software development. Either way, these jobs are likely to be more interesting. And DP management will be able to deploy available skilled resources to tackle the tricky tasks of establishing distributed computing networks and database systems.

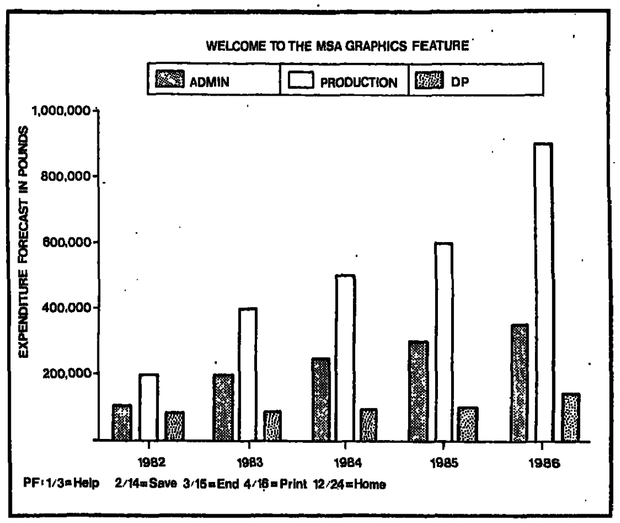
An online accounting service depends on a number of diverse applications in many locations being able to interlink with each other and with shared information bases. A branch office, for example, may have a requirement for a self-contained small computing facility with occasional need to interface with the corporate information service.

For the end user, the same screen will be used as a window on to all accounting systems. It is therefore important that there are automatic interfaces to the modules that make up and integrate services via an easy to use mechanism. In addition to smooth integration of the variety of systems needs, it is also important to have software and networking tools which enable a diversity of hardware to be interlinked.

The computing resources in an organisation could now comprise a mix of mainframes with online terminals, smaller systems like the 4300, down to baby microcomputers. Local and corporate accounting requirements could encompass all these machines as well as many different accounting applications.

So, although the capability for online accounting is available now, it will still take a few years before online finally inherits the DP world.

Malcolm Peltu is a former editor of Computer Weekly, now a freelance journalist.



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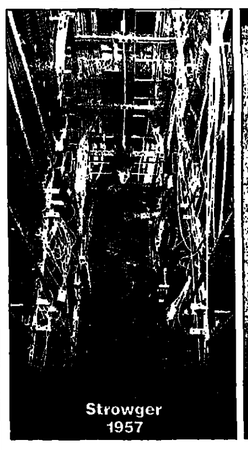

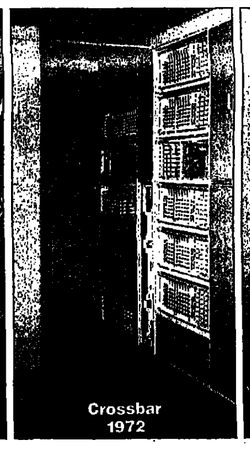

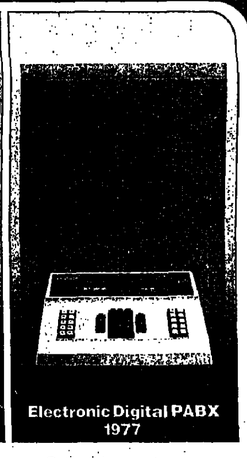

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(0200)

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SUBSIDISED MORTGAGE, PENSION & LIFE ASS, FREE LUNCH, FLEXI HOURS and EARLY REVIEW. These opportunities are offered by this international company who are looking for Analysts/Programmers to work on large DEVELOPMENT projects. They retain IBM 4300 machines running under DOS/VSE using COBOL, CICS and DL/1. You should have a minimum of 2 years' IBM COBOL with some analysis and user liaison experience. S.6402

PROGRAMMERS £10,000
ICL COBOL LONDON

Our client, a dynamic organisation, has recently acquired an ICL 2900 machine and seeks to recruit two programmers. Ideal applicants should have, a minimum of 2 years' ICL 2900 VME COBOL preferably with some SCL experience. Opportunities include TRAINING on IDMS and TPMS. These positions offer scope for promotion and large NEW DEVELOPMENT projects. S.6397

PROGRAMMERS £10,500
IBM PL/1 LONDON

This expanding city organisation is looking to recruit several PL/1 programmers to work on a wide variety of projects. Applicants should have a minimum of 18 months' PL/1, a good standard of education and ability to deal with users. Company offers TRAINING in DATABASE, excellent promotional prospects, variety and stability. S.6417

PROGRAMMERS £10,000
IBM COBOL LONDON

TRAINING IN CICS and DL/1. Excellent opportunities have arisen for programmers with a minimum of 18 months' IBM COBOL, within this prestigious company. This is an excellent opportunity to join an expanding data processing department and become involved in a variety of systems. S.6405

PROGRAMMERS £10,000
MINI COBOL LONDON

Subsidised Mortgage! This major Merchant Bankers based in the City is looking to recruit programmers to work on a variety of financial projects. They retain WANG machines and ideal applicants will have WANG COBOL, but ANY COBOL will be considered. This is an excellent opportunity for ambitious people who are confident to deal with users. F.6376

PROGRAMMER/ANALYSTS £11,000
HONEYWELL COBOL
E. LONDON/ESSEX

Our client, a large manufacturing company based on Essex/East London borders, is currently looking for programmer analysts. Applicants should have 2 years' programming experience with some systems involvement. They retain Honeywell 64 machines under GCOS using COBOL and DATABASE. The company offers an excellent benefit package and career advancement. F.6418

ANALYST PROGRAMMERS
c£10,500
RPG II cLONDON

Experienced RPG II Analyst Programmer required to assist in the development of this new Banking installation. The current hardware being used is an IBM System 34. Ideally you will have around two years' experience which need not necessarily contain banking. The benefits offered by the Company are excellent and include subsidised mortgage. M.6334

SOFTWARE HOUSE £8-14,000
RPG II AND RPG III ONLY LONDON

Our client is a software house who specialise in GSD projects. They are based in the City of London and require a minimum of one year of either RPG III or RPG II programming experience. They would be pleased to hear from applicants with software house experience but who wish to expand or concentrate their efforts on GSD users. M.6120

DATA GENERAL c£9,000
BASIC+2 cLONDON

Well-known company based in Central London require two experienced Basic +2 Programmers to help in the development of client systems. Ideally you will have at least 18 months' commercial experience on mini hardware not necessarily Data General. Prospects are good as training will be given in Systems Analysis. F.6420

GSD ANALYST c£9250
WILL TRAIN cLONDON

This well-known manufacturing company are looking for either bright Programmers to continue programming whilst being trained in Analysis or experienced Analyst Programmers. All applicants should have at least 18 months' RPG II or III experience and be prepared to work extensively on new development projects revolving around what is currently System 34 hardware. M.6419

IBM SYSTEM 38 c£9,500
TRAINING SURREY

Excellent opportunity for an experienced RPG II Programmer to progress onto IBM latest GSD System. At least one year's RPG II programming in a commercial environment. Full training will be given where necessary along with the opportunity to train in System Design. Good company package including 4 weeks' holidays, staff restaurant and car parking facilities. M.6416

PROGRAMMERS to £12,000
BASIC +, +2 OR AIMS
LONDON/H. COUNTIES

We are in contact with several companies in London and the Home Counties who are looking for Programmers with minimum 18 months' BASIC +, +2, or AIMS, on DEC PDP computers. Clients include Banks, Brokers and Manufacturers, they offer generous company pakages and excellent salaries. F.GEN

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Our client, one of the foremost telecommunications companies in Europe, are looking for a number of people to work either in Switzerland or Italy. To qualify for a position in Switzerland you should have several years of in-depth telecommunications expertise in quality assurance or similar, preferably on Vax equipment. You must also speak fluent German. To work in Italy you must have had experience of either ITT System 12/40 or network 2000. Systems engineering experience on either of these machines could be useful. Italian is not necessary in this case. These are super opportunities to widen your experience and gain the benefits of working abroad.

SYSTEMS ANALYSTS/LECTURERS c £11,000 BERKSHIRE

If you are a really experienced Systems Analyst with experience of VME and/or DME or TPMS or indeed any other TP monitor and you are looking for a change, this could be your opportunity. Our client is looking for people who would like to use their DP knowledge and communications skills to train people to become effective Systems Analysts. Call for further details!

SENIOR SYSTEMS ANALYST £11,500 SURREY

Ideally applicants should have minimum four years' analysis on IBM equipment, under DOS or DOS/VSE and CICS. Programming background advantageous but not essential. Applicants must have done major project from implementation to support. Applications include sales, purchase and nominal ledgers. You will also be required to deputise for Project Manager. Excellent career prospects and fringe benefits.

PROGRAMMERS £8,000-£12,000 LONDON & HOME COUNTIES

CALLING ALL IBM COBOL PROGRAMMERS

If you have a minimum of two years' experience under DOS/DOS VSE, with or without CICS, our client would like to hear from you.
VM/CMS or DLI would be an added bonus. We offer a large selection of interesting positions, high salaries and perks.

PROGRAMMER/TEAM LEADER c £11,000 LONDON

Our client wishes to recruit a DP professional with five years' programming experience which should include some IBM Cobol, also writing program specifications on large machines. Previous supervisory experience is essential, along with Database, On-Line Systems and Modular Programming techniques, to take charge of a significant development team and existing systems.

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IMT is an established consultancy in the areas of IBM mainframes and online databases.
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If you envisage yourself in a challenging role, please apply in confidence to Ralph Reed at the address below, giving details of your career to date.

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HEWLETT-PACKARD OPPORTUNITIES

Due to the rapid expansion of the HP sector we have many clients, some of whom are first time users, seeking to recruit experienced programmers and analysts. Obviously HP experience is preferable but not a prerequisite as some users are prepared to retrain.

ANALYST/PROGRAMMER W. LONDON to £11,000

International company based in West London seeks an experienced analyst/programmer to join their development team. The successful candidate will eventually take over the project and be responsible for all maintenance and development. Applicants must have 3 years Cobol including some HP experience and knowledge of IMAGE database.

SENIOR ANALYST/PROG HOME COUNTIES to £12,000

Installation based West of London with a heavy commitment to DP requires a senior analyst/programmer to join their expanding department. Applicants should have around 4 years experience gained preferably on HP equipment although other manufacturers would be considered, especially if on line and database techniques have been deployed. Excellent career prospects are offered along with all large company benefits.

ANALYST/PROGRAMMER LONDON c £9,000

Software house has requirement for programmers and analyst/programmers to work in either their UK or international project teams. The minimum requirement is 2 years HP Cobol gained in any commercial environment.

ANALYST/PROGRAMMER SURREY c £9,000

Manufacturing company utilising a HP 3000 with a possible upgrade in the near future requires an analyst/programmer to join their small team. Applicants should have in excess of 2 years experience gained in any commercial environment as training on HP systems and software will be given where necessary.

PROGRAMMERS LONDON c £8,000

International financial concern seeks programmers with around 18 months commercial COBOL experience. Applicants with a good academic background are preferred and in return training will be given on HP equipment. For the successful candidate there will be quick progression to senior programmer levels. Perks include annual bonus, subsidised mortgage and some overseas travel.

ANALYST/PROGRAMMER LONDON c £9,500

Small but expanding HP 3000 site seeks an analyst/programmer to join their team. The successful candidate will be involved in development of new systems and possibly assume a management role in the near future.

This is just a small selection of current requirements; for details of these and others not advertised call us now.

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Apex

(0236)

IMMEDIATE CONTRACTS FOR PROGRAMMERS

ANALYST PROGRAMMER	Bromley	IBM 4300 APL
ANALYST PROGRAMMER	Croydon	IBM COBOL IMS DB/DC
ANALYST PROGRAMMER	London	IBM SYS 34 RPGII
ANALYST PROGRAMMER	Bromley	DEC DIBOL RSTS
DESIGNER	Croydon	IBM COBOL IMS DB/DC
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Software

circa £10,000 (October review)

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To strengthen this team we have an excellent career opportunity for a Senior Software Engineer to specialise in software design and maintenance using high level languages.

You should be an innovator, holding a degree in computing science or allied subjects with programming experience allied to an understanding of computers gained in a Scientific or Engineering environment.

Rewards will include a salary of circa £10,000 (review in October), excellent non-contributory pension and life assurance scheme, free beer allowance, generous hotel concessions and substantial assistance with re-location costs where applicable.

Qualified candidates, male or female, should write or telephone for application form to:

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SALES EXECUTIVES Micros/Peripherals	to £25K Sutton, Surrey
ANALYST PROGRAMMERS COBOL IBM/HP/ICL ME29	to £10K London/Essex/Sussex/Hants.
OPERATOR IBM 4341	to £7K West Sussex
ANALYSTS IBM/COPICS	to £12K Plymouth/London/Middx.
SYSTEMS ANALYST & PROGRAMMERS On Line exp/VMEB or K/or George 3	to £11K Surrey/East Anglia/Bucks
SOFTWARE DESIGNERS COBOL/PASCAL/RTL2	to 13K Sussex.
SYSTEMS/APPLICATIONS PROGRAMMERS Strong IBM environment preferred	to £12K West Midlands
ANALYST PROGRAMMERS ICL 2956/Database/Fortran/Pascal	to £12K London
ANALYST PROGRAMMERS DEC/DG/WANG/BASIC	to £12K Berks/Bucks
ANALYST PROGRAMMERS RPG3/System 38	to £10K Norfolk
SOFTWARE ENGINEERS RADAR/Military/ATE/CORAL	to 11K Home Counties
PRINCIPAL CONSULTANTS Commercial Software exp/Accounting qualifications Data General COBOL	to 15K Berks.
PROGRAMMER ANALYSTS IBM/ICL COBOL	to £9K N. London/Scotland
PROJECT LEADERS/MANAGERS	to £13.5K London/Home Counties.
PROGRAMMERS CAD/CAM	to £12K Essex
ANALYSTS Manufacturing/Production	to £12K Wales/Bristol
SENIOR PROGRAMMERS COBOL/IMS	to £11K Northants/Bristol

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Real-Time Applications

London/EEC: Salaries to £14K

A highly successful British Systems and Software House has outstanding opportunities for real-time software experts from Programmer to Team Leader level. Applicants should offer at least two years' real-time programming experience in either FORTRAN, PASCAL, MACRO II or Assembler. Particular hardware is not important, but you will be expected to have had exposure to a leading mini- or micro-computer. Application areas of interest are: Data Communications and Networks, Message/Packet Switching, Process Control or Defence. Candidates who demonstrate management potential will, of course, be considered for the more senior positions. Ref. L/28/A

Pascal Programmers

H. Counties: Salaries to £10K

The Research and Development division of a leading multi-national corporation requires a number of Programmers to assist in the development of both Applications and Systems Software. All respondents should possess a Degree or H.N.C. in a relevant discipline followed by at least two years in industry. A minimum of one year's development experience on either Intel 8080/5 or Z80 based systems, preferably running under CP/M or UNIX is essential as is fluency in Pascal. A knowledge of protocolling techniques and an Assembler language are useful supplementary skills and will attract a salary premium. Ref. L/28/B

RSX II Applications & Systems

Hants/Surrey: Salary to £12K

On behalf of the Consultancy and Software Services Division of an E.E.C.-based Company we are seeking a number of Systems Engineers and Applications Programmers. Software programming expertise should include fluency in a high level language such as Pascal or Fortran whilst some involvement with an Assembler will be considered a useful secondary programming skill. In certain cases candidates must have actively participated in the development of a distributed processing system where either PDP 11/RSX or VAX/VMS hardware and software is utilised. Additionally, the Company wishes to recruit for its Research & Development Unit a number of programmers who are familiar with M.O.D. hybrid systems where stringent programming and design specifications within a multi-microprocessor environment are employed. Ref. L/28/C

Communications Programmers

Central London: Salary to £10K

A number of Development Engineers are required for the Communications Division of a market leading supplier of message and packet-switching systems. Of particular interest to our client will be Programmer/Designers who have at least two years' experience in the design and development of terminal controllers and protocol convertors, especially where this has required familiarity with bi-synchronous line procedures. Fluency in a high-level language such as Pascal and a working knowledge of Assembler are prime requirements. Applicants who are familiar with IBM, Burroughs or ICL mainframe protocol standards will be especially welcome. Ref. L/28/D

Process Control Systems

Central London: Salaries to £15K

A Systems & Software House, with an excellent reputation for providing total systems solutions, has a number of vacancies for Programmers and Project Leaders with at least two years' Process Control systems experience. Suitable candidates for the senior positions will be required to have had responsibility for system hardware procurement, installation, commissioning and software generation, preferably in the chemical or oil industries. Applicants for the Programming posts should be fluent in an Assembler and a high level language such as Pascal or RTL/2. Although the vast majority of work is in-house, occasional visits to client sites will be required and a degree of mobility is, therefore, essential. Ref. L/28/E

Micro Design Engineers

Wilts/Avon: Salary to £10K

A number of Micro-Processor Design and Development Engineers are sought by a leading micro-computer and semi-conductor manufacturer. As there are a considerable number of positions available, the variety of skills required is, necessarily, diverse. However, experience in one or more of the following areas is essential: customisation of Operating Systems such as CP/M or MP/M, with a salary premium attached to a knowledge of a networking O.S.; compiler and cross-compiler development particularly if utilising PASCAL or C; familiarity with a leading MDS and, also, experience in the design and production of interface hardware and software. A degree of customer contact is a feature of most of these positions and, therefore, an outgoing personality and good communication skills are required. Ref. L/28/F

Micro Software Development

Cambridge: Salaries to £12K

Programmers and Software Team Leaders are urgently required to assist in the development of applications and systems software for a new generation of micro-computers. Successful candidates for the positions of Team Leader will be fluent in a high-level, block structured language and have specified and implemented at least one compiler. Working in-house, their responsibilities will include the design, development and commissioning of systems software and the evaluation of commercial packages submitted by sub-contractors. Programmers will also be expected to offer fluency in a block-structured language and, preferably, have gained the majority of their post-graduate experience on micro-based systems. High standards of documentation and the ability to conform to tight dead-lines are required of all respondents who, in return, will be rewarded by highly competitive salaries and a dynamic working environment. Ref. L/28/G

Navigation Systems

Inner London & Home Counties: Salary to £12K

A highly regarded supplier of precision instruments and electronic devices is seeking several Software Development Engineers for either its Central London support facility or its Thames Valley based Research & Development Laboratory. Suitable applicants must be numerate graduates who are currently involved in the design and development of micro-processor based control systems. Practical programming skills must include total fluency in one or more of: Pascal, Fortran or Macro II. Candidates should have the ability to resolve complex software problems for end users demanding total reliability or where operating conditions are not necessarily conducive to high technology products. Ref. L/28/H

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(0244)

The Royal Borough has an ambitious approach to the use of computers and computer systems. Currently running on IBM 4341 with VM/SP, DOS – VSE/AF 2, CICS and VSAM. We are shortly moving to VTAM and the linking of 8140s to the 4341. We provide personal computing facilities to a rapidly growing number of users via APL, ADRS, API and BASIC.
We are seeking to fill the following posts in our lively and professional DP Department.

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Ref. CW/711

£10,536-£11,589 p.a. inc. (pay award pending)

We need an experienced Systems Programmer to assist us to maintain the momentum of change in the organisation. Heading a team of four, the position will be responsible for the evaluation, installation, maintenance and development of all software in addition to the development and control of network procedures.
You should have at least three years' experience as a Systems Programmer, sound assembler knowledge and experience of the software currently installed.

PERSONAL COMPUTING OFFICER

Ref. CW/712

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Personal computing is seen as a key area of expansion supplementing our own development projects and allowing user staff to enhance existing and develop new systems.
The work will include conducting feasibility studies into user requirements and recommending the use of personal computing facilities. In addition, the work will also involve the design of systems using 8100 and mainframe facilities.
You should have at least five years' D.P. experience including analysis and knowledge of system software in addition to a working knowledge of APL and BASIC.
Benefits for these posts include modern offices, subsidised restaurant, sports and social club, interest-free season ticket loan, generous holiday arrangements and flexitime.

For further information contact Tony Eldred on 937 5464 Ext. 662. Please tel. ext. 282 for application forms. Closing date for application: 23 July 1982.

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Salary will depend on the experience you can offer us and there are excellent fringe benefits, including generous relocation expenses where necessary.

Please write with details of your qualifications, experience and current salary to: Lucy Ward Dyer, Personnel Officer, Mullard Southampton, Millbrook Industrial Estate, Southampton SO9 7BH. Or telephone Southampton (0703) 775533.

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PROJECT LEADERS
Communicative skills are paramount as you will be the prime interface between the user and development teams. You should have a sound commercial business background coupled to the technical knowledge associated with analysis and design.

SYSTEMS ANALYSTS
ALL LEVELS ARE REQUIRED - You will be proficient in design techniques and able to play a major role in the successful implementation of systems. IBM hardware/software experience, particularly in the areas of database and teleprocessing, would be a distinct advantage.

PROGRAMMERS
Once again ALL LEVELS should apply. The minimum requirement is 1 year's COBOL gained in any IBM environment. For the Senior roles you will have knowledge of CICS and/or DLI and be able to inspire and train less experienced staff. The company would also like to talk to IBM ASSEMBLER programmers in SOFTWARE ambitious to develop careers in SOFTWARE and TECHNICAL SUPPORT.

ANALYST/PROGRAMMERS
A stepping-stone to systems analysis. You will have the same skills as above but in addition, design techniques will be required. Potential is a key word in this area.

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An odd job title, but applications are also invited from those professionals currently developing Mini/Micro systems, APL, Operational Research and Information Processing. The company are in the enviable position of being able to use the technology of the 1980's to investigate, develop and implement new systems and require the skills to match.

In all cases freedom to use your CREATIVE FLAIR and take full advantage of a COMPREHENSIVE PERSONAL DEVELOPMENT POLICY are the principal reasons why you must join our client now! The starting salary - purely negotiable! Our client expects the best available and will pay whatever is necessary to get it. Additional benefits are excellent and a FULL RELOCATION PACKAGE is offered. The new premises will be operational by the end of AUGUST, so those joining now will immediately start at the new location.

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*"OPEN EVENINGS"

With members of our client's DP management, we are holding three open evenings for informal interviews. These are on:

- Tuesday 20th July at Ware Moat House, Baldock Street, Ware, Herts.
- Wednesday 21st July at Stevenage Moat House, High St., Old Town, Stevenage North, Herts.
- Thursday 22nd July at Green Man Hotel, Mulberry Green, Harlow, Essex.

Drop in and see us at any time between 4.30pm and 10.30pm. We will provide refreshments and tell you WHY YOU SHOULD BECOME PART OF THIS EXCITING CHALLENGE NOW!

Alternatively, phone us on the number below quoting Ref TE/200 for more information and immediate appointment for interview.

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The successful candidate will have proven man-management experience, together with a thorough understanding of DEC/Equivalent Mini based systems, preferably RSTS/E, BASIC+, to enable him/her to lead a team of 15/16 people in a multi-project environment. Previous software house experience is not essential, however the ability to meet realistic deadlines on commercial projects is a prime requirement.

Remuneration will include a salary of £12,000, a company car and several attractive fringe benefits.

For further details and early interview telephone PHIL HARKOM **021-643-8501** (business hours) or **021-308-4285** (eves/wkds) or fill in and return the freepost coupon Computer People Midlands, FREEPOST, (no stamp) Alpha Tower, Birmingham B1 1BR.

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to $50,000

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It is essential to possess a degree in Computer Science or related subject, coupled with an in-depth experience of MVS internals encompassing CICS, ACS/VTAM, SPS, TSO, SPF, and a sound working knowledge of SMP4.

A good appreciation of telecommunications, ideally ASF/VTAM, but TSAM or VTAM would be acceptable.

The successful candidates would be expected to have installed and maintained program products, also to be fully conversant with ASSEMBLER language.

These are exceptional opportunities for highly skilled d.p. professionals who have a strong desire to succeed in a competitive environment.

Contact: Janet Chilvers on 01-437 3942.

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APPLICATIONS PROGRAMMERS should have at least two years' IBM COBOL programming experience. Knowledge of real-time transaction, processing, database, or financial systems would be an advantage.

SYSTEMS PROGRAMMERS should have at least two years' experience of some of the following: DOS/VSE, CICS, TSO, DATABASE, MVS, VM.

For further information, please contact Mark Irens quoting reference. CW 1507/1

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(1) Good degree
(2) Perfect communication skills and professional manner
(3) 25-32 years old
(4) Proven track record in a variety of application areas and on at least two different computers

You will mainly be involved in pure consultancy but also in project management. This is seen as a logical career step for high fliers who have proved themselves in a user environment and are ready to move forward.

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A COMPUTER PROGRAMMER

is needed for the MRC-funded Epidemiological Monitoring Unit in the Department of Medical Statistics and Epidemiology to assist in research on environmental health problems. Candidates should be graduates and have suitable experience. The gross salary will be in the range of £6,070 to £10,576 plus £1,036 London Allowance, depending on experience and qualifications.

Applications, consisting of full curriculum vitae and naming two referees, should be sent to the Assistant Secretary at the above address by 5th August, 1982.

For further information: telephone 01-636 8636 Ext. 244/245.

(0232)

Section Leader
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Advanced industrial automation will be the life blood of Britain's industry of tomorrow, and Thorn EMI Automation are now establishing a strong lead in this rapidly growing field. Due to expansion and new contracts, a key position has been created within a specialist team of Software Engineers at the company's headquarters in Rugeley, Staffordshire.

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The position carries a salary of up to £10,785 (under review) depending on age, qualifications and relevant experience.

Application forms are available from the Assistant Secretary, ULCC, 20 Guilford Street, London WC1N 1DZ. Telephone: 01-405 8400, Ext. 341

Applications close two weeks after publication of advertisement.

(0208)

UNIVERSITY OF NEWCASTLE UPON TYNE
COMPUTING LABORATORY

TEMPORARY DEMONSTRATOR

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Salary will be at an appropriate point on the Grade 1B (Bar) scale: £5,285-£7,700 per annum, according to age, qualifications and experience.

Further particulars may be obtained from the Deputy Registrar (F.P.) The University, 6 Kensington Terrace, Newcastle upon Tyne, NE1 7EU, to whom applications (2 copies) together with the names and addresses of three referees, should be submitted as soon as possible. Please quote reference CW.

0207

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(1) Research Fellow: To join an existing research team working on a successful ongoing project into the design and implementation of a multiple microprocessor distributed computing system. Applicants should have either a higher degree or equivalent experience and have a working knowledge of system software and the use of procedural languages. The appointment is for 18 months in the first instance and the salary will be on the scale £6,070-£10,575 pa (under review).

(2) Research Officer: To join a new research team to work on an SERC collaborative project with industry into the design and implementation of a broadband coaxial cable local area data network. The applicant should have a good honours degree and experience in the use of microprocessors and an interest in the writing of networking software. In addition, a knowledge of electronic circuits and high frequency techniques would be an advantage. The appointment is for 3 years and the applicant may register for a higher degree. The salary will be on the scale £5,285-£7,700 pa (under review).

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(0199)

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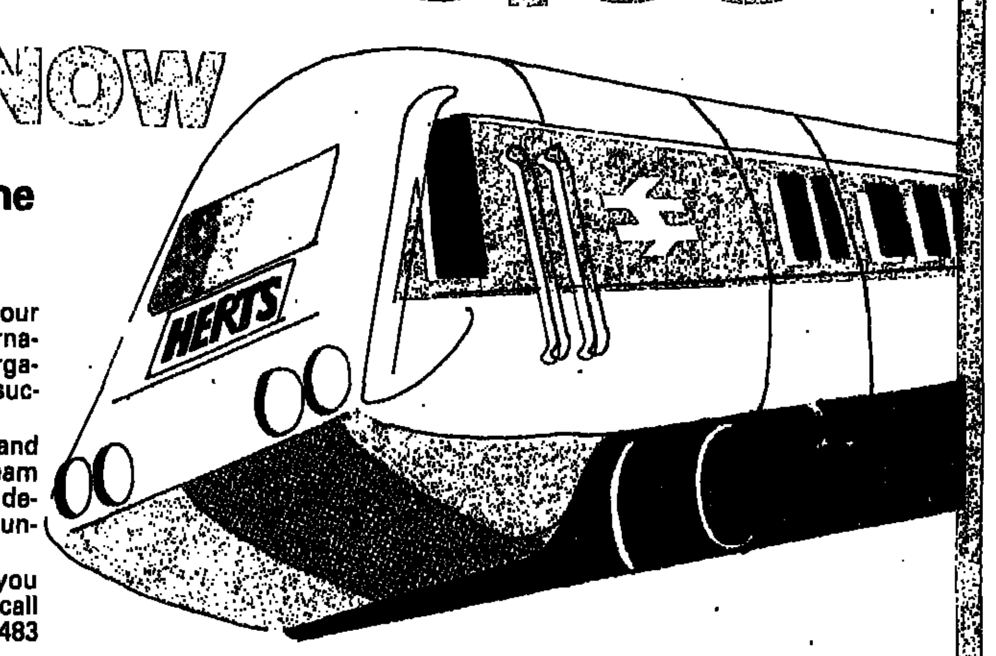

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UNIVERSITY OF ESSEX

Lecturer/ Senior Lecturer
in the Department of Electrical Engineering Science

Applications are invited for a post of Lecturer/Senior Lecturer (salary scale: Lecturer – £6,070 to £12,860, Senior Lecturer – £12,306 to £15,410) in the Department of Electrical Engineering Science for appointment from 1 January 1983, in the area of Traffic Analysis of Modern Communications Networks and Switching Systems. This post is being funded by British Telecoms for an initial period of five years. Candidates should have an honours degree and relevant experience in communications engineering, computer engineering, computer networks, or mathematics related to traffic and queueing problems. The lectureship would suit applicants with either a background in communications engineering and with good mathematical ability wishing to develop an interest in traffic engineering, or computer engineers with a good mathematical background related to queueing problems interested in applying their knowledge to communication networks. In exceptional circumstances, and for a candidate with proven ability and status in the traffic engineering field, the appointment at senior lecturer level will be considered.

The Department of Electrical Engineering Science specialises in Electronic Systems, with particular research interests in Telecommunication Systems, Industrial Electronics, Circuit Studies and CAD, Display Systems, Computer Systems and Microprocessor Applications, and Signal Processing.

Applications (nine copies), including a curriculum vitae and the names and addresses of two referees, should reach the Registrar (AG/140/L), University of Essex, Wivenhoe Park, Colchester CO4 3SQ, from whom further particulars may be obtained, by 26 August.

(0240)

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(0239)

Office Automation Project

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(b) design and specification of systems.
(c) liaison with manufacturers.
(d) programming.
(e) implementation of systems.

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Closing date for applications: 5th August 1982

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INTERNATIONAL AIRPORT

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We are seeking an ambitious and self-motivated Consultant with a professional approach to DP recruitment activities for contract or permanent personnel. You will display a successful track record within recruitment consultancy, and in return, we will offer higher personal rewards based on achievement, coupled with greater scope and responsibility. Ref: C9200

COMMUNICATIONS CONSULTANT £16,000 + car
This leading software organisation requires a Consultant with up to a decade of experience in network planning, dimension and equipping, and message switching, preferably System X25. The successful applicant should also have a good working knowledge of the design and implementation of data communications, software, and associated security. Ref: C9210

TECHNICAL SUPPORT MANAGER £15,000
Our client, based in London, is a well-known commercial organisation with a large investment in the development of online systems. This company is currently seeking a Technical Support Manager to take charge of a small team of specialists, whose functions include software programming, network and database control. The successful applicant must have a CICS or SHADOW background with systems programming using BASIC ASSEMBLER language plus any high level language experience. This position would ideally suit someone wishing to take the next step into management, and at the same time maintaining technical competence. Ref: C9192

SENIOR SYSTEMS PROGRAMMER £15,000
This large manufacturing company situated in the London area requires a Systems Programmer with BAL and solid OS/VS1 or MVS experience. The successful applicant will take charge of a team of three. Excellent career prospects in a progressive and expanding environment. Ref: C9220

SYSTEMS INSTRUCTOR HERTS to £15,000
Our client is continuing to expand its business, and as a consequence has a fast-growing data processing complex. In order to maintain the high standards of its internal training facilities, the company needs a talented instructor with at least seven years' systems and COBOL programming experience, together with a working knowledge of large IBM systems using IMS. Ref: C9206

RPG 2/3 PROGRAMMERS to SYSTEMS CONSULTANTS to £15,000
A number of our clients situated in London/Home Counties and South East England are seeking Programmers and Analysts with 2-3 years' RPG experience, preferably on System/34 and/or System/38 equipment, capable of working on their own initiative. Applications include the specification, design and implementation of a wide variety of commercial systems. Ref: B9187

ANALYST/PROGRAMMER HERTS to £14,300
This large organisation is currently seeking an Analyst/Programmer with a minimum of 3 years' COBOL, CICS together with 12 months' design experience, preferably in a DOS/VS environment, using database facilities. There is considerable scope to progress in this rapidly expanding business. Ref: C9201

ANALYSTS to PROJECT LEADER level to £14,000 + benefits
Three of our clients situated in Middlesex, London and Kent Coast, with commitments to developing online systems, are seeking development staff at all levels. The successful applicants will have at least 2 years' programming experience in COBOL, or PL1 together with a proven track record in systems development in insurance, Banking or other financial applications. A knowledge of CICS would be an added advantage. Benefits include bonus and profit sharing. Ref: A9041

SENIOR SYSTEMS ANALYST £13,500 + profit share
This London-based financial organisation needs someone with at least 2 years' design experience to take an important role in the development of their applications. Previous online experience is essential, together with a good understanding of database concepts. A knowledge of CICS and/or IDMS would be idyllic! Ref: C9081

BUSINESS ANALYST MIDDX £ Market+
Our client is a major computer user, and is currently creating a new division to handle the marketing of new products. As a consequence, the company needs a Business Analyst with at least 2 years' sound systems experience coupled with a programming background. This is an ideal opportunity to take a lead in development of a wide range of applications using a variety of software aids and hardware tools. Ref: C9085

RESEARCH ANALYST to £13,500
Our client is seeking someone with specialist skills to undertake a consultancy role in the investigation of hardware and software facilities, and assess its suitability to the Group. The job entails a wide range of activities including communication with suppliers and users, preparing findings and recommendations, pre- and post-installation of products, education and support. The successful applicant must possess a wide variety of technical skills; together with a broad perspective and good business sense. Ref: C9216

SHIFT CONTROLLER MIDDX £13,000
This large organisation is seeking someone with extensive operational and supervisory experience to take charge of one of their shifts running under MVS. Ref: A9228

CHIEF PROGRAMMER SUSSEX COAST c£12,000
This company requires someone with a strong IBM COBOL and/or ASSEMBLER experience to take charge of their team of Programmers in a CICS/DL1 environment. This position offers great opportunities, accompanied by excellent salary and fringe benefits. Ref: A9051

PROGRAMMERS to SYSTEMS ANALYSTS SUSSEX to £12,000
This Crawley-based company offers excellent prospects to those COBOL Programmers and Systems Analysts who wish to enhance their technical skills. Excellent fringe benefits. Ref: A9045

ANALYSTS & PROGRAMMERS HANTS to £12,000+
This major company is undergoing development of new online systems and is seeking Analysts with at least 12 months in system design, preferably with an insurance or financial background. Vacancies also exist for Programmers with 2 years' COBOL experience. Benefits include profit sharing and annual bonus. Excellent prospects. Ref: C9185

TEAM LEADER HERTS £11,500
Our client, a well-known manufacturing organisation, require someone with supervisory skills to take charge of their small team of Analysts and Programmers in a DME 2 environment. The successful candidate must have a sound systems and COBOL programming background, together with a good understanding of ICL 1900 or 2903/2904. Ref: C9145

PL1 and COBOL PROGRAMMERS to £11,500 + benefits
A number of our clients situated in London, the Home Counties, and S.E. England, need Programmers with a minimum of 2 years' PL1 or COBOL experience for the development of realtime systems. A knowledge of CICS and DL1 would be an advantage. One of our clients is also seeking a Junior Programmer with at least 6 months' commercial experience in PL1, where there is a prospect of moving later into analysis. Ref: B9102

DATABASE SPECIALIST LONDON to £11,500
Our client is seeking to complement its Technical Support Team with a specialist responsible for database design, the monitoring of program development to ensure their efficient use, and performance tuning of operational systems. This successful applicant will have sound experience of database design, and a good understanding of CICS in an MVS environment is desirable. Ref: C9217

TEAM LEADER c£11,000 + Bonus
PROGRAMMER c£9,000 + Bonus
Our clients, an international leisure company situated in London, are seeking a Team Leader with a minimum of 3 years' IBM COBOL experience and a good working knowledge of CICS, to lead a team of 4 Programmers, also a Programmer with a minimum of 18 months' IBM COBOL preferably with CICS experience. Both positions offer long term security and excellent salaries, conditions and benefits. Ref: B9079

CHIEF PROGRAMMER £11,000 (early review)
Our clients, a large commercial industry in Middlesex, are seeking someone with several years' IBM COBOL experience ideally gained in an OS environment. Knowledge of CICS, TOTAL and ROSCOE would be useful, together with good supervisory skills. Among the many excellent benefits offered are free BUPA, relocation where applicable. Ref: A9092

SYSTEMS ENGINEERS LONDON/CHESHIRE c£11,000
This leading computer organisation requires Software Engineers with at least three years' practical experience of installing, testing and debugging equipment and systems. An appreciation of mini/micro computer systems/peripherals, and a knowledge of industrial interface equipment for digital and analogue signals, backed up by an HNC in Electronic Engineering is desirable. The successful applicants will be involved in selection, configuration through to installation of hardware for industrial realtime computer systems. Ref: C9304

SYSTEMS INSTRUCTORS LONDON £11,000
This well-known organisation, highly skilled in the training of all levels of development personnel, is seeking two talented Analysts with communicative skills, to impart the knowledge, techniques and disciplines of Systems Analysis. A programming background is also an important attribute for this challenging and responsible position. Ref: C9078

ANALYST/PROGRAMMERS MIDDX £ Market
This company is in the process of creating a new section to handle the development of a wide variety of bespoke systems. Computer professionals are needed with 2-3 years' COBOL, BAL or PL1, together with some systems experience where this has involved a fair degree of user contact. Excellent prospects. Ref: C9212

PROGRAMMERS UK & ABROAD to £11,000+
Major Software House has a requirement for Programmers with 3 years' COBOL experience to work on various client projects. The successful applicants must have a good understanding of ICL 1900/2900 system software, or HONEYWELL GCOS, TDS, DMIV. Generous overseas allowances given where applicable. Ref: C9103

SYSTEMS DESIGNERS LONDON to £11,000
This major Software House is currently seeking Systems Designers with HEWLETT PACKARD 3000 experience, to specify and develop commercial systems for various clients. An ideal opportunity to consolidate your experience and widen your hardware/software base with a progressive organisation. Ref: C9111

FORTRAN SPECIALISTS LONDON/HOME COUNTIES to c£11,000
Programmers are required to join existing development teams to work on a variety of applications including scientific research, engineering and commercial projects. Good fringe benefits. Ref: C9211

PROGRAMMERS AND ANALYSTS £8,000-£11,000
Our client is currently looking for several Programmers and Analysts with a sound COBOL programming background, preferably using BURROUGHS equipment. The successful applicants will be involved in the development of a number of commercial online applications using the latest equipment and systems software. Ref: C9215

LECTURER MIDDX £10,500
This major manufacturing company needs someone with experience in FORTRAN and/or CORAL to take responsibility for teaching their graduates within the Group, using DEC/VAX and other equipment. The successful candidate will probably be educated to HNC or HND level. Excellent scope and prospects for this demanding position. Ref: C9189

PROGRAMMER/ANALYSTS to £10,500 + Profit Share
Our client based in London, is seeking two Programmers with at least 2 years' solid COBOL experience to work on the development of online/database financial applications. These positions would ideally suit those wishing to put their theoretical systems knowledge into practical use. Ref: C9198

ICL PROGRAMMERS SUSSEX to £10,500
Our client, based in Crawley, is expanding its development teams, and as a consequence need Programmers with at least 18 months' ICL COBOL experience. A knowledge of VME/B or VME/K would be useful. Ref: A9166

ANALYST/PROGRAMMER MIDDX/LONDON to £10,500
This large organisation requires someone with an IBM COBOL programming background to assist in the development of their online systems. Systems software training will be given, where necessary, in a progressive environment. Ref: C9108

JUNIOR SYSTEMS PROGRAMMER £10,500
Our client needs a Junior Systems Programmer with 12 months' experience of DOS/VSE together with some knowledge of BAL. A good understanding of CICS would be useful, as the successful applicant will initially assist in looking after the CICS system, and VM development. This position would ideally suit a technically minded person who has moved through Operations, and is looking for further career advancement. Ref: C9136

Tel. 01-834 5923 (Daytime)
01-834 0061 (24 hours)
or call evenings & weekends:
REF. A: 01-840 0129
REF B: 01-794 5937
REF C: 01-942 1178

BCS

The above vacancies are only a token selection taken from our current files, and we are always pleased to hear from computer professionals wishing to further their career objectives.

BUICK COMPUTER SERVICES

Recruitment Division 72 Rochester Row
Victoria, London SW1P 1JU

Tel: 01-834 5923 (Daytime)
01-834 0061 (24 hours)

OPERATIONS

DOS OPERATIONS MIDDX. £8,750 + benefits
A large international organisation are seeking two Operators with a minimum of 2 years' DOS/VSE, CICS experience to work on their IBM 4331 range. A 2-shift sytem is in operation. The company offers an excellent salary, free BUPA, L.Vs and good promotional prospects. Ref: A9040

OPERATIONS SUPERVISOR N.W. ENGLAND £8,500
A well-known manufacturing company is seeking someone with at least four years' HONEYWELL Operations experience, preferably with DPS 100. The successful applicant must be able to communicate at all levels of D.P. and line management. Excellent working conditions and benefits apply, together with relocation expenses where applicable. Ref: B9240

BURROUGHS OPERATORS LONDON/SURREY to £7,800
These companies need Operators with a minimum of 6 months' experience on B6700, B6800 or B6900 equipment, to work a 2-shift system, where there are excellent prospects. Ref: C9159

SENIOR OPERATOR BEDS c£7,500
A minimum of 18 months' experience of MVS/JES2 is required to work on IBM 3031 and 4341 range. An excellent career structure in an ultra-modern environment coupled with many fringe benefits are offered. Ref: B9181

DEC OPERATOR LONDON £7,200+benefits
Our client, a leading international financial organisation needs an Operator with a minimum of 12 months' AIMS and/or RSTS. A knowledge of SWIFT would be an advantage. The site operates a 2-shift system, and the numerous benefits offered include subsidised MORTGAGE facilities. Ref: B9241

DEC OPERATORS SURREY c£7,000 + fringe
Large organisation in Surrey is seeking an Operator with at least 18 months' RSTS/E experience (will consider RSX) for small department on 2 shifts. Ref: B9182

DOS OPERATOR LONDON c£7,000
This busy installation is seeking an Operator with a minimum of 18 months' DOS/VS experience to work in a 2-shift environment. This position would ideally suit someone wishing to move quickly to a senior position with more responsibility. Ref: C9152

OPERATOR ESSEX to £7,000
A well-known manufacturing company are seeking an Operator with approximately 2 years' experience of DOS/VSE for their IBM installation. A 2-shift system is worked, and the position is progressive for the right applicant. An above average salary together with an excellent career path is guaranteed. Ref: A9150

OS/VS1 OPERATOR MIDDX. £6,500
Required for busy installation running under 3 shifts. This position would ideally suit someone with about 18 months' good technical experience in order to liaise with TSG. Good prospects and benefits attributed to the position. Ref: C9104

ICL OPERATORS LONDON £6,500
A leading Banking organisation require Operators with around 12 months' VME/B and/or DME experience. The site comprises of 2 x 2960 range. The positions offer long term security and a structured career path leading to Programming. Ref: B9059.

OPERATOR LONDON c£6,300
This position would suit an ICL 2904 Operator who would like to be trained on the fast expanding DEC(VAX) System. The site is based in the City, and will soon be operating on a 2-shift basis. Many good opportunities exist for a career minded person. Ref: B9183

JUNIOR OPERATOR LONDON c£5,500
This progressive site requires someone with at least 6 months' DOS/VS experience to work within a 2-shift system. Excellent prospects. Ref: B9199

PROGRAMMING CONTRACTS:

PL1, CICS, MVS designers	U.K	3-12 months
PL1, CICS	U.K., Europe & U.S.A.	3-12 months
RPG2	U.K. & U.S.A.	3-12 months (ren.)
RPG3	U.K. & U.S.A.	3-12 months (ren.)
COBOL, DMS2 & GEMCOS	U.K.	3-9 months
BASIC (CPM)	HOLLAND	3-12 months (ren.)
ICL COBOL	U.K. & EUROPE	3-12 months
COBOL, CICS	U.K., EUROPE & U.S.A.	3-12 months (ren.)
PL1 or COBOL, CICS for IBM 8100	U.K.	6 months

OPERATING CONTRACTS:

HONEYWELL (various)	U.K.	3 months

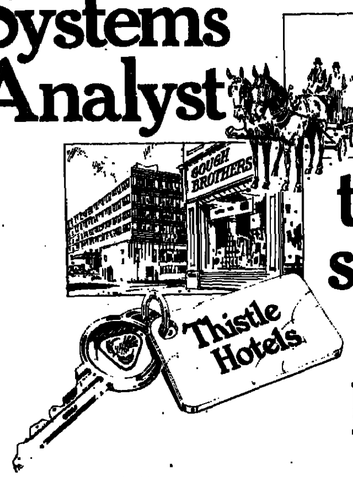
Ref: A9219

Tel. 01-834 5923 (Daytime)
01-834 0061 (24 hours)
Or call evenings and weekends
REF. A: 01-840 0129
REF. B: 01-794 5937
REF. C: 01-942 1178

BCS

The above vacancies are only a token selection taken from our current files, and we are always pleased to hear from computer professionals wishing to further their career objectives.

For a Professional Systems Analyst



the scale is staggering and the prospects immense

With some companies it's easy to outgrow your environment and find your progress grinding to a halt. But at Scottish & Newcastle Breweries we have the room and the prospects for you to realise your ambitions to the full.

As one of UK's leading companies we operate on an extremely large scale — employing over 24,000 people and generating an annual group turnover exceeding $600 million.

Right now we are looking for professional Systems Analysts with upwards of four years' experience who have the capacity and flexibility to gain a wide understanding of our diverse organisation.

As a Systems Analyst with us in Edinburgh you will be involved in the design and development of DP and office systems to answer the business needs of users throughout the Company. You will control and motivate your team in order to ensure the most effective use of analysis and programming resources.

Linked computer centres at Edinburgh and Newcastle with IBM 370/158 and 4341 Processors run MVS, TSO, CICS and IMS, serving a national network of 400 terminals and mini processors. Future developments will include the installation in late 1983 of an IBM 3083.

Our systems division provides a highly stimulating working environment where ability and ambition are quickly recognised and rewarded. And, unlike many organisations, career progression can extend well beyond the systems function so career prospects are virtually unlimited.

Immediate rewards include a commencing salary of up to £11,000 (current salary scale ranges up to £14,100) with a benefits package which includes a non-contributory pension scheme, life assurance, concessions on company products and relocation assistance if required. To gain an even fuller picture of the scale of Scottish & Newcastle Breweries and the prospects available write or telephone:

Miss M. J. Gillanders, Personnel Manager, Scottish & Newcastle Breweries plc, Head Office, 111 Holyrood Road, Edinburgh EH8 8YS. Telephone 031-556 2591.

Scottish & Newcastle Breweries plc

CAD/CAM

Our client is acknowledged as one of the pioneers in CAD/CAM technology.

An interesting opportunity exists for CAD/CAM **Systems Designers** and **Programmers** to join a small but expanding CAD group within the Management Services Department, The group consists of production and development teams working with Prime mini-computers.

Applicants should have at least three years experience of Fortran together with three years experience of CAD or Prime minis. Above all you should have sufficient skills to play a significant role in the development of new CAD Systems.

Salaries, terms, and conditions are all you would expect from a major engineering organisation, and a generous relocation package is available where appropriate.

For further details please contact our advising consultant Geoff King at the address below or telephone him on 0296 630506 in the evenings or at weekends.

(0221)

CASTLE RECRUITMENT

ECL House, Park View Road, Berkhamsted, Herts. HP4 3EY Phone: (04427) 74941

COMPUTER MANAGER IBM S/34

c. £12,500 **S.E. LONDON**

We are a successful and expanding company in the food industry and need a computer professional to establish and manage the installation of a System 34. This will prove an exciting opportunity for someone of proven ability who will be totally responsible for designing and implementing a range of systems which will eventually embrace all major commercial activities within the company. A thorough knowledge of RPG/IBM and the ability to effectively communicate at all levels is required. Benefits include private medical insurance, pension scheme and relocation allowance where necessary.

Please write with full C.V. details or telephone for an application form, Commercial Director, Hygrade Meats Ltd., Latona Road, London, SE15. Tel. 01-732 8711.

(0243)

COMMERCIAL INVENTORY SERVICE COMPANY LTD.

CIS is a computer bureau who provide a service to the automotive trade. Due to the imminent relocation of our offices from London to Leeds we require

SENIOR COMPUTER OPERATORS

for the Company's NCR CRITERION V8570. Applicants with at least two years' experience on NCR V series Hardware and VRX operating systems are asked to contact Miss K. Hewitt on **01-404 5962** for an application form.

(0273)

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Norman Magnetics Ltd., the British Media Manufacturer are looking for Senior and Junior Sales People to sell in selected areas in many part of the UK.

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ANALYST — PROGRAMMER

Salary Range APS — 502

£7371 — £9628 (National Pay award pending).

Eastbourne is a prestige South Coast holiday resort within easy reach of the Sussex Downs and Beachy Head. The Council's activities are unusually wide, and, in addition to all normal district functions, include a transport undertaking, farms, Highway's Agency, and extensive catering and entertainment facilities.

The above post offers an opportunity for a versatile conscientious person to participate in the development and enhancement of both batch and On-Line Systems, as a member of a small development team in a progressive computer installation.

The successful applicant will have the opportunity to utilize a mixed machine environment of ICL 2904, CMC Reality, and PDP 11/44 equipment. Programming languages include COBOL, BASIC and PLAN. Experience of at least two languages would be advantageous, but appropriate training will be given where necessary.

Conditions of service are good, and temporary housing accomodation and relocation expenses are available in appropriate cases.

Further information may be obtained from Mike Shipley, Computer Service Section, Tel: (0323) 21333, Ext. 332, and application forms from the Borough Treasurer, Grove Road, Eastbourne, BN21 4TW, closing date 30th July, 1982.

BRYMBO STEEL WORKS LIMITED

have a vacancy for a

PROCESS CONTROL ANALYST

THE JOB

- To lead a small team engaged in the application of Computer Control Systems to on-line production operations, involving not only the maintenance of existing systems but the necessary modifications, improvements and additions to the software of these systems as indicated by production requirements.
- The initial workload will centre on our 2 year old Billet Mill which has a central Computer linked to a series of micro-processors which control individual plant operations.
- The Company have also emberked on a policy which will see further application of computer control techniques to production processes.

THE IDEAL CANDIDATE

- Will be 30 to 40 years of age.
- Will have had some years of experience of, and direct involvement in, the application of process control systems to production operations, preferably, but not essentially, in the steel industry.
- Ideally will have had direct experience in the design and operation of software for controlling operations for rolling mills and, possibly, continuous casting machines.
- Will be able to work with production management and engineers of other disciplines in these areas.
- Will be able to demonstrate ability to achieve results in what is a demanding continuous process industry.

THE COMPANY

- Employs some 1,500 employees and is the leading and largest manufacturer of high carbon and low alloy forging steel billets in the U.K.
- Is located 12 miles south of Chester, one hour's travelling time from Liverpool and Manchester and within easy distance of both the Snowdonia National Park and the North Wales holiday resort area.

Please apply, giving full personal details and history to:-

Personnel Manager,
Brymbo Steel Works Limited,
Brymbo, Wrexham, Clwyd, North Wales.
Telephone: Wrexham 756333

A Company application form can be obtained from Mrs. B. Robinson, Secretary to the Personnel Manager.

GKN — Britain's largest international engineering group

ANALYST/PROGRAMMERS

CITY/OVERSEAS **£EXCEPTIONAL**

Opportunities occur at various levels for persons with good BASIC, BASIC+ and/or C programming backgrounds to join a rapidly expanding International Systems House and Consultancy. Excellent careers are available in the development and enhancement of Banking Systems, Data Communications or Message Switching systems in London, America of the Middle/Far East. Applicants should have experience of DEC hardware and software knowledge which includes exposure to communications working. An attractive salary range, dependent on experience and location and reviewed at 6 monthly intervals is supplemented by a generous company benefits package.

Ref C4015

SYSTEMS ANALYSTS

SURREY **c£12,000**

Two leading companies in the financial sector based in Surrey are actively looking for SYSTEMS ANALYSTS to assist with the development of sophisticated new systems on IBM equipment. Candidates will have had experience in designing and installing systems perhaps using structured methods in a banking, insurance or allied environment. The opportunities for advancement coupled with very generous benefits packages make these positions very attractive to already well-qualified people wishing for further development in their careers. MORTGAGE facilities are offered in both cases.

Ref R3848/77

ANALYSTS & PROGRAMMERS

MIDDLESEX **£NEG**

Our client, heavily committed to the development and implementation of new financial systems involving both large ICL 2900 and new, advanced mini-computers is seeking Analysts and Programmers at all levels to join their teams. We would be particularly interested in hearing from persons with an ICL Systems and/or Programming background which has included either VME exposure or the use of mini-computers in a COBOL, BASIC or PLAN environment. These are excellent opportunities that involve a high degree of user contact, use of the very latest techniques and a good career path commanding a very attractive salary range.

Ref C3975

ALL LEVELS

CENTRAL LONDON **to £12,000**

The London insurance sector is currently the source of a number of opportunities for Systems and Programming Staff wishing for a change in the direction of their careers. We have identified a number of positions available to PROGRAMMERS, ANALYST PROGRAMMERS, DESIGNERS and SYSTEMS ANALYSTS with IBM programming backgrounds in COBOL, PL/1 or RPG. Exposure to on-line or Database systems will be an advantage but is not necessary in all cases. These are largely development positions and the companies involved all offer excellent facilities for advancement and benefits packages which in some cases include MORTGAGE arrangements.

Ref R3803

ANALYST/PROGRAMMERS

KENT **c£10,000+BENEFITS**

Insurance Company in South West Kent are embarking on a major expansion programme. For this reason they are looking for 2 ANALYST/PROGRAMMERS. The company utilises an IBM SYSTEM 38, therefore candidates would have a knowledge of IBM GSD equipment, and also RPG II or III expertise. There will be much development work, and the opportunity to alter, amend and improve existing systems. The two successful candidates will be key members of a new team, and will be offered excellent promotional prospects. The salary will be circa £10,000 pa with excellent insurance company benefits available, and a very pleasant environment in which to work, and perhaps live.

Ref S4003

VARIOUS LEVELS

LONDON/HOME COUNTIES **£HIGH**

We require ALL LEVELS of IBM GSD professionals to fill our current vacancies. These positions range from JUNIOR PROGRAMMERS to SENIOR SYSTEMS ANALYSTS, in a wide range of companies which include Banks, Software Houses, Insurance companies and Computer Bureaux. Therefore, if you would like a change of position, and a very wide range of options, then contact us for further details of these excellent opportunities.

Ref S0001

TCR **Targa Computer Recruitment**

6 Liverpool Street London EC2M 7NH Telephone 01-283 9941 Telex 894858

Systems Analyst

IMI Titanium is Western Europe's leading manufacturer of titanium and titanium alloys.

There is now an opportunity for a Systems Analyst to join the Systems Development Section at our Waunarlwydd plant near Swansea.

The section uses computers for a range of applications including stock evaluation, order processing and invoicing, the preparation of wages and product costs/trading information. The successful applicant will be expected to lead and motivate a team involved in the development of programmes for new applications.

Candidates, male or female, should possess 3/5 years systems analysis or programming experience in a manufacturing industry, have received a good education in relevant subjects and be a good communicator at all levels.

This challenging position offers an attractive salary, a company pension scheme and employees profit sharing scheme.

Please telephone or write for an application form to:

Mr. L.F. Edkins, Plant Personnel Manager, IMI Titanium, P.O. Box 57, Waunarlwydd, Swansea SA1 1XD. Tel: 0792 873471.

(0204)

IMI titanium

CENTRAL REGIONAL COUNCIL

COMPUTER DEPARTMENT

OPERATIONS SUPPORT SUPERVISOR

Viewforth

Salary: AP III, £8,886 – £7,371

35 hours – 5 day week – Monday to Friday. Flexible Working Hours Scheme in accordance with the requirements of the Department.

The candidate must have proven experience in the areas of Network Control/Installation, IBM utilities, JCL, and be capable of working with minimum supervision as part of a small team responsible for Operations Support within an IBM 3033S environment with both local and remote on-line locations. Knowledge of VM and MVS advantageous.

Applications in writing stating name, age, experience and qualifications to the computer Manager, Central Regional Council, Viewforth, Stirling by 25 July 1982.

(0260)

IBM SYSTEM 38

COMPUTER SYSTEMS CONTROLLER

£10-12k p.a.

LOCATION MIDDLESEX

Our client, who provides services to the offshore oil industry, is installing an IBM System 38 in Hayes, Middlesex. They are seeking a Data Processing professional with good operations background to take complete charge of the installation.

Successful candidate must have in-depth knowledge of IBM System 34 or 38 hardware and software, management experience, and most important, be able to liaise diplomatically with outside clients.

For further information, please contact Annic Breuer on (01) 836 8885 or, if you prefer, write to her at:

PRESCOT COMPUTERS LIMITED
11/13 Broad Court
Covent Garden
London WC2B 5QN

(0262)

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The world's most advanced telecommunications project

On the edge of London's Northern green belt, one of Britain's foremost high technology organisations is entering a crucial development phase of the world's most advanced telecommunications project. It is the most exciting chapter in a story of investment by STC in New Southgate — creating the facilities and environment to produce the most significant breakthrough in the fastest growth sector of high technology industry.

System X is a real watershed in telecommunications. No other digital communications system can match the sophistication of its computer-based architecture or its capacity to handle a staggering 700,000 user requests per hour. At the heart of the system is its unique software — enabling it to address the complex real-time demands upon a major telecommunications network. Despite the strides already taken in information technology it is these developments which will unlock the full potential for the "office of the future".

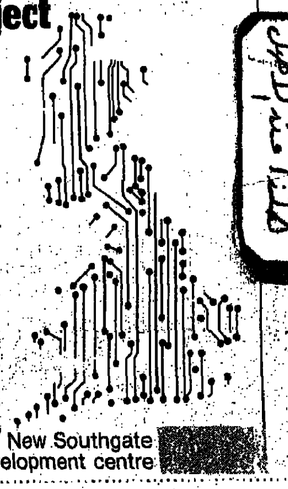
System X represents a quantum leap ahead to the convergence of microprocessor and telecommunications technology and will do more to challenge the intellect of the Software Engineers working on it than any other project this decade.

Our need is for Senior Real Time Software Engineers with a background in communications, defence or process control systems, aircraft simulation, signalling or similar real-time application.

Ideally, you should have at least ten years' experience and be capable of operating at a senior level. We are interested in those who wish to manage a significant software team and also in those who may prefer to contribute as technical specialists. Progression in our organisation is on a "dual ladder" basis where both managerial and technical contributions achieve equal recognition. You will be working within an established software department which is professionally led, and will grow and develop its role over the next few years.

We fully recognise the importance of these positions, and therefore are offering highly attractive salaries, comprehensive benefits and exceptional career prospects.

Find out more about the most exciting development project of the decade, by telephoning Roger Edmonds Brown on (01) 368 1234 ext. 2879 (answering service after office hours). If you prefer, write with full details of your experience to him at: Standard Telephones & Cables plc, Oakleigh Road South, New Southgate, London N11 1HB.



STC New Southgate
The communications development centre

Switzerland

Real Time Software for Process Control

Senior Software Engineers/Software Engineers

An expanding sub division of an International Company specialising in Process Control for Power Station Computer Systems and Energy Management Control Systems seek additional Engineers for permanent careers on English speaking Projects in Switzerland.

The senior positions fall into four categories and candidates should have relevant experience to work on the following areas:

Quality Assurance
- ★ Methods
- ★ Tools
- ★ Operating Systems
- ★ Programming Environment

Man Machine Communications
- ★ Display Systems
- ★ Plotters
- ★ Mimic Boards
- ★ Engineering Consoles

Communications Networks
- ★ X25
- ★ Decnet
- ★ Systems Architecture

Power Applications Systems
- ★ Electric Network
- ★ Closed Loop Control
- ★ SCADA

Software Engineers; we are looking for candidates to concentrate on establishing new standard Software. Successful candidates should have most of the following experience: A degree, 3/5 years' Real Time experience, PASCAL, CORAL, Assembler, VAX 7/80, PDP11, VMS, RSX11M and Industrial Systems. CW28/1

English Speaking Project

Telecommunications Software Development

We have been retained by an international telecommunications company to recruit several SOFTWARE ENGINEERS to develop and implement software for a NEW PUBLIC DATA SWITCHING SYSTEM, involving working on Operating Systems, Diagnostics, Telex applications and X25 interfaces.

Candidates should have a degree, 18 months plus Assembler experience, preferably in a Telecommunications environment on minicomputers. An in-depth knowledge of Real Time Operating Systems would be advantageous.

Successful Candidates may look forward to enhancing their career prospects, gaining valuable experience in an international environment. CW28/2

Interviews will take place in London later this summer. For further details on the above two companies, conditions of employment and living in Switzerland. Please send C.V. or write for application form quoting the reference number.

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Our client is one of the big international success stories of the computer industry with a considerable reputation for innovation and quality and a turnover rapidly moving towards £1 billion. Their product range extends from large computer systems to micros embracing among other things, DDP and small business systems. They are a large, secure and fast expanding organisation that manages to maintain all the benefits of a small company environment. Substantial new products come along with astounding regularity and everything points towards a very exciting and successful future.

The company's next phase of expansion calls for the recruitment of experienced computer people who have a substantial record of success in selling computer systems to industry and commercial end-users as well as major systems houses in

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Applications: material control, accounting, payroll. The company is growing rapidly and further applications are likely.

Our client has retained us to recruit a Manager who will run their computer department, will assist in planning and will take part in future development of their systems.

The job includes:

- ★ Day to day administration of operations.
- ★ Co-ordination with users.
- ★ Budgeting and planning of future capacity.
- ★ Some system design and program development.

Our client needs a manager with a good technical background. This should include knowledge of DEC RSTS, some experience of programming in BASIC and a general understanding of commercial accounting.

Please apply to us in the first instance as the company's advisers. You should send your c.v. to T. Williams, Roots & Williams Associates, 17 Wilson Street, London EC2.

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Our client, a major manufacturer, is currently seeking salespeople in the following categories:

NEW BUSINESS SALES. Good education, a good record in selling business equipment, and a sound knowledge of commercial applications are required.

COMPETITIVE SALES. You must already be a Mini- or Mainframe salesperson with a first-class trade record and an in-depth knowledge of competition.

STRATEGIC ACCOUNT SALES. As above but preferably with the additional experience of selling to major accounts.

Please telephone Camberley (0276) 32888 (office hours) or Farnborough (0252) 516978, evenings and weekends.

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So you want to change your boss?

WHILE most managers who visit us at Sales and Marketing Recruiters do so with the firm intention of obtaining a job with a new employer, many come along merely to discuss their career in terms of where they might go next.

Of the many different conversations we have in this context, two in particular are recurrent: "I wish to change both my employer and my occupational discipline" and "I would really like to set up my own business, but I have yet to think of an original idea or discover an unsatisfied demand." These are both apparently reasonable requests that stem from limited business experience and a lack of logical consideration for the total implications of such requirements.

The most common examples are technicians wanting to get into selling, salesmen seeking to secure management status by moving to another company, and managers attempting to advance to a high level of responsibility by the same means.

This is a completely unreasonable expectation. When a company goes outside its own ranks for personnel, it does so to obtain skills that are wholly or partially absent from its own organisation.

No company can afford the risk of employing a stranger unless his skills and capability are already an established fact. If the need was merely that of potential, then there is little doubt that such people are already in the company's employment. The problems are time and risk. The duration and therefore cost, of waiting for someone to gain fluency in a new discipline, as well as getting to know the product, the company, the market, etc, is too much even to contemplate.

For those who are determined to advance their status by moving companies, there is likely to be only one possibility, and that is to move a long way "down market" in terms of company size and stature. Many very small companies are prepared to use the influence of status to attract people from large companies. A district sales manager for a major computer manufacturer may be just the man for a small turnkey systems house which needs a sales and marketing director, even though his complement of subordinates may decline from a significant number to one — including himself!

More often than not, people who wish to change occupational discipline or increase status by way of changing company, do so for reasons of frustration and disillusion within their present employment. They can see no way of progressing within their present company, and out of sheer desperation decide to move in order to achieve their objectives. In many cases, this is the only available course; the mistake is in expecting the change of employer to bring about an instant solution to the career "blockage".

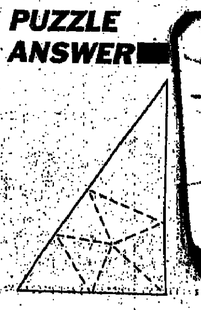
Without any doubt, the best way and the best chances of advancing status and responsibility or changing job function, exist within one's present company. If all attempts — rather than assumptions! — to progress make it clear that there are no real opportunities to pursue one's aspiration, then the best alternative is to move. However, it only makes sense if such a move is "sideways" into another company where the new job can be tackled with confidence, using existing skills and experience to achieve early success.

Of course, it is essential to establish at the interview stage that real potential exists for promotion into the kind of job you wish to pursue. If subsequent employment does not lead to the satisfaction of your aspirations, you have either chosen the wrong company, or you never really had the talent in the first place.

Setting up your own business is an altogether different affair and many books have been written on the multifarious ramifications of such a venture.

I suspect that most people who say they would like to set up their own business if only they had an original idea, or if only they could obtain the finance, do so merely for effect. It is as if they feel obliged to protect an entrepreneurial image and create the impression that they have the drive, talent, enthusiasm and courage to go beyond the foetal position of being an employee, if only their fates were not against them. The fact is, one does not need an original idea to set up a new business and there is never a shortage of financial backing for a sound business proposition. There are innumerable examples from fish and chip shops to the whole of Japanese industry, which make it abundantly clear that originality can be a positive disadvantage.

The most difficult thing about setting up your own business is merely the act of starting out, and my simple, yet deceptively obvious advice for those who are determined to go it alone, but are unsure of what they should do, is simply to do what you do best in the industry you know best.

Alan Williams

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